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REPORT

OF THE

COMMISSIONER OF CORPORATIONS

ON

THE STEEL INDUSTRY

PART I

ORGANIZATION, INVESTMENT, PROFITS, AND POSITION OF UNITED STATES STEEL CORPORATION

JULY 1, 1911

DEPARTMENT OF COMMERCE AND LABOR
UNITED STATES OF AMERICA

WASHINGTON
GOVERNMENT PRINTING OFFICE
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LETTERS OF TRANSMITTAL.

DEPARTMENT OF COMMERCE AND LABOR,
OFFICE OF THE SECRETARY,
Washington, July 1, 1911.

SIR: I have the honor to transmit herewith Part I of the Report of the Commissioner of Corporations on the Steel Industry, the said part dealing with the organization, investment, profits, and position of the United States Steel Corporation.

Respectfully,
CHARLES NAGEL,
Secretary.

The PRESIDENT.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF CORPORATIONS,
Washington, July 1, 1911.

SIR: I have the honor to transmit herewith Part I of a Report on the Steel Industry, made to the President under your direction and in accordance with the law creating the Bureau of Corporations. The said part deals with the organization, investment, profits, and position of the United States Steel Corporation.

I desire to mention as especially contributing, under my direction, to the preparation of this report the names of Mr. Luther Conant, jr., Deputy Commissioner, and Mr. Francis Walker, one of my assistants.

Very respectfully,
HERBERT KNOX SMITH,
Commissioner.

To Hon. CHARLES NAGEL,
Secretary of Commerce and Labor.

LETTER OF SUBMITTAL.

Department of Commerce and Labor,
Bureau of Corporations,
Washington, July 1, 1911.

Sir: I have the honor to submit herewith Part I of a Report on the Steel Industry. This part deals with the organization, investment, profits, and position in the industry of the United States Steel Corporation. Additional parts will be submitted later dealing with costs and with prices.

The basic industry of steel making affects the whole people of the United States. Its organization is a matter of public concern (not merely of private interest), and a great national resource, iron ore, lies at the foundation of the business.

The dominant concern is the United States Steel Corporation. There is here set forth (*a*) the causes of the formation of the Corporation; (*b*) its actual investment contrasted with its capitalization; (*c*) its rate of profits; and (*d*) its degree of control in the industry.

The Steel Corporation was the culmination and the result of a remarkable and even dramatic period in the steel industry. Until about 1898 the bulk of the business was distributed among a very considerable number of concerns. There was sharp competition, modified by frequent pools and price agreements of greater or less duration and effectiveness.

In 1898 began an era of great consolidations, with capitalizations ranging from $30,000,000 to $100,000,000, usually mergers of many smaller companies. In most of these, as in the earlier price agreements, the ruling motive was the removal of competition.

They did not, however, finally eliminate competition. On the contrary, a broad movement at once became apparent which threatened competition on a larger scale and probably more severe than any in steel history. This was the process known as "integration."

The situation in 1899–1900 was as follows: There were three great companies—the Carnegie Company, the Federal Steel, and the National Steel—dominating the production of crude and semifinished steel. This may be called the "primary" group. Six other large concerns—the American Steel and Wire, American Tin Plate, American Steel Hoop, American Sheet Steel, National Tube, and American Bridge—severally controlled these lighter finished products. These formed the "secondary" group.

But, large as these concerns were, no one of them was entirely self-sufficient. The "secondary" group was dependent on the "primary" for its crude steel; the "primary" largely dependent on the "secondary" for a market for its products. Few were completely "integrated;" that is, few carried through under one control, with the accompanying advantages, the entire industrial process from the ore to the finished product, linking up ore and coal mines, transportation, blast furnaces, steel works, rolling mills, and finished manufacture.

Immediately, however, came the next step. These great concerns almost simultaneously began the final linking up of the chain of production. Once begun by one concern, others followed in self-defense. The "secondary" companies began to reach back, acquiring ore reserves and crude steel plants. For example, in 1900 the Steel and Wire Company, whose supply of materials had previously been purchased mainly from the Carnegie or the Federal company, planned to make its own steel; likewise the National Tube Company. The "primary" concerns, finding these their chief customers turning into rivals, retaliated by reaching forward to the manufacture of finished products.

Paramount in importance was the ore. The recognition of that importance came strangely late, but, once recognized, it became an axiom that no large concern could stay in the business unless fortified by its own ore reserves. By 1900 the bulk of the Lake ores was in the hands of less than a dozen companies, with a similar concentration in coking coal.

Such efforts on the part of these great concerns, in striving each to "integrate," to make itself wholly independent, threatened to result in a great and sudden increase and duplication of the steel producing and finishing capacity of the country, and to involve them also in an invasion of each other's business.

Thus there was suddenly revealed to the industry what the trade press at the time called "the impending struggle of the giants," a contest between great concerns who under such circumstances might be forced to work out, in rigorous competition, the survival of the fittest.

Such were the conditions in the steel industry in 1900. The spark that lighted the train was the threat of the Carnegie Company to erect a great tube plant near Cleveland, thus invading the field of finished manufacture.

Steel men and the various associated financial interests regarded this situation with much alarm. In such competition they saw a great danger to their businesses, especially to the profitable quasi monopolies in certain branches of the trade. In averting it they also saw a great opportunity. The extraordinary era of industrial expansion was still on; the public were still eagerly absorbing large issues of securities. By merging these conflicting interests into a great corporation, the threatened "steel war" would be averted, and great profits realized from the flotation of securities.

With amazing swiftness, in a few weeks, the United States Steel Corporation was thus organized, and began business on April 1, 1901. Its total capitalization was a little over $1,402,000,000 (including bonds). It is strictly a "holding" company—that is, it does not mine, manufacture, transport, or sell; it simply owns the stock (as a rule all the stock) of its constituent concerns. The concerns acquired were as follows:

Acquired 1901:
- Carnegie Company (of New Jersey).
- Federal Steel Company.
- National Steel Company.
- American Steel and Wire Company.
- American Sheet Steel Company.
- American Tin Plate Company.
- American Steel Hoop Company.
- American Bridge Company.
- National Tube Company.
- Bessemer Steamship Company.
- Shelby Steel Tube Company.
- Lake Superior Consolidated Iron Mines.

Acquired subsequently:
- Union Steel Company (1902).
- Clairton Steel Company (1904).
- Tennessee Coal, Iron and Railroad Company (1907).

Thus competition between these concerns was eliminated, while enormous profits were made from the flotation of securities, with, also, an unparalleled stock commission to the underwriting syndicate, which netted a clear profit of about $62,500,000 in cash.

At its formation the United States Steel Corporation (referred to herein as the "Corporation") controlled about two-thirds of the country's production of crude steel, and from one-half to four-fifths of the principal rolled steel products. It comprised ore, coal, limestone, natural gas, railway and steamship companies, blast furnaces, steel works, rolling mills, finishing plants, and various other properties. It was thus a thoroughly integrated concern, from ore to finished products.

There remained outside the merger a number of great companies of the primary sort, such as Jones & Laughlin, the Pennsylvania, Cambria, Lackawanna, Republic and Colorado Fuel and Iron companies, and numerous concerns of the secondary type. While overshadowed by the Steel Corporation, these included strong, efficient, and growing businesses, furnishing a basis for vigorous competition.

INVESTMENT AND CAPITALIZATION IN 1901.

The Steel Corporation is the greatest industrial concern in the United States, with the largest properties, and of international importance. It is the most conspicuous example of the modern corporate organization of great businesses. As such, the relation of its investment to its capitalization and to its earning power are matters of public concern. The Corporation itself has recognized this fact in its public reports, and has also furnished very extensive information to the Bureau.

The Corporation was organized with (in round numbers) 510 millions of preferred stock; 508 millions of common stock; 303 millions of Corporation bonds, and about 81 millions of underlying and miscellaneous obligations; a total of over 1,402 million dollars.

Speaking broadly, such capitalization amounted to the claim, the representation, that there was a value in this concern which would justify a fair business return on this capitalization. The Bureau finds, on the contrary, that in 1901 the fair market value of its tangible property was about 700 million dollars, slightly less than one-half its capitalization. The other half, the excess of about 700 million dollars, is thus separated and stands out, embodying the essential public questions raised by the Bureau's analysis of its investment. In so far as that excess represented value in 1901, it was value due either to increased earning power from elimination of competition; concentrated ownership of the basic natural resources, iron ore and coal; or, in some degree, integration efficiency.

When such values are capitalized into dividend or interest bearing securities, they involve important public problems. They are merely another name for price policy, and the whole public is ultimately concerned in steel prices. For that sufficient reason the bulk of this part of the report is devoted to an analysis of the Corporation's investment.

Three separate methods have been used in valuing its assets in 1901: (*a*) By historical study of the formation of constituent concerns; (*b*) by market values of the securities of constituent concerns; (*c*) by detailed estimates of physical properties, classified by departments of business. By the first method the valuation is $676,000,000; by the second, $793,000,000; and by the third, $682,000,000. None of these figures includes any merger, integration, or monopolistic factors arising from the combination of 1901. It is precisely the object of the Bureau to distinguish such values from ordinary property value.

The first valuation rests chiefly on evidence that the tangible property of most of the constituent concerns did not exceed the preferred stock. A cash option price was usually fixed by their promoters, and the original owners could take this, or an equal amount of preferred stock, with a bonus in common stock, in the new combinations.

This was the case with the National Steel, American Tin Plate, American Sheet Steel, American Steel Hoop, American Steel and Wire, National Tube, and American Bridge companies. The Federal Steel Company's property somewhat exceeded its preferred stock. In the Carnegie Company, reliable book values indicate that its tangible assets did not exceed its bond issue. The property of the Lake Superior Consolidated Iron Mines was taken as equal to the par value of its stock.

This gives the valuations at the dates of organization. Adding now the surplus earnings of these concerns up to April, 1901, plus the new cash provided for the Corporation, and sundry miscellaneous obligations representing property, gives the total stated above, $676,000,000.

Valuation by market prices of the securities of constituent companies (second method) gives about $793,000,000, or $117,000,000 more than the preceding valuation. Such excess is natural, as this method necessarily covers all property, including intangible merger values in these consolidations prior to the Steel Corporation.

The valuation by departments (third method), the most detailed and conclusive, was as follows:

Manufacturing properties, including blast furnaces	$250,000,000
Transportation properties	91,500,000
Coal and coke properties	80,000,000
Natural gas and limestone properties	24,000,000
Current assets	136,500,000
Ore properties	100,000,000
Total	682,000,000

In July, 1902, in defending its capitalization, the Corporation itself made an estimate similarly classified. If we omit iron-ore properties in each case, that estimate exceeded the third valuation by the Bureau by about $175,000,000, or 30 per cent. But in ore the Bureau's valuation was $100,000,000, while the Corporation's was $700,000,000, seven times as great, a difference of $600,000,000. Thus the ore reserves, the dominant factor in the steel industry, are, in this valuation of its assets by the Steel Corporation, made to stand for the excess of capitalization over value of tangible assets.

And it is true, as is thus tacitly assumed by the Corporation itself, that in these ore holdings, under the present status of ownership and control, there exists an earning power and a control of the industry on which rest largely those ultimate intangible merger values which must be invoked in any attempt to justify its great capitalization.

The determination of the ordinary market value of this ore in 1901 segregates such ordinary value from the peculiar merger and combination values evidently attributed to it by its owner. The Bureau's valuation of $100,000,000 for the ore was reached by a study of market prices for similar properties about 1901; from the price paid by the Corporation for a large part of its own holdings; and from a calculation of the "present worth" of the royalties paid on leased ore. There was a marked agreement in the results by these various methods, and it is certain that $100,000,000 is a liberal figure.

To sum up: The actual market value of the Steel Corporation's entire tangible properties at its formation, omitting all factors of merger, integration, and concentration, was not over $700,000,000, just about one-half its capitalization.

The Bureau does not assume to say that the capitalization should have been one-half what it was, or indorse at this time any particular theory of capitalization. It has simply separated the market value of physical property in this vast concern from value based on earning power derived from intangible factors. It has defined these intangible factors and pointed out their peculiar relationship to price policy and the public interest, to wit, merger value, integration value, monopolistic value, and above all the incalculable industrial power that rests on the control of the bulk of the available iron ore of the country.

1901–1910.

INCREASES IN PROPERTY.—Since its formation, the Corporation, from surplus earnings (allowing for depreciation and changes in securities), has made good much of the original excess of its capitalization over tangible property. That excess in 1901 was about 700 million dollars, or 100 per cent, and in 1910 only about 280 million dollars, or 24 per cent. The total tangible value in 1910 was 1,187 million dollars. As in 1901, there is omitted here all the merger values heretofore referred to, and all appreciation of natural resources above the actual cost thereof to the Corporation.

PROFITS.—The rate of profit has been calculated, not on the Corporation's capital stock, but on the total investment as computed by the Bureau. Operating, administrative, and general expenses, as well as taxes, have been deducted from earnings; also true depreciation, a matter of some intricacy. The Corporation's allowance for depreciation, including mineral exhaustion and obsolescence, has exceeded a necessary allowance. The Bureau has carefully determined from the records of the Corporation the proper depreciation, and has restored the excess to profits.

Thus arrived at, the average rate of profit on actual investment from April 1, 1901, to December 31, 1910, was 12 per cent. It was highest in 1902, 15.9 per cent, and lowest in 1904, 7.6 per cent. The yearly rates do not indicate any pronounced tendency, but have on the whole slightly decreased.

It must be remembered, however, that 12 per cent profit for one small concern out of many is one thing. Other concerns may make much less. It is a very different thing when, as in this case, one-half of the whole industry has been maintained on the level of a 12 per cent profit.

It must be made entirely clear that this 12 per cent is the rate of profit on the whole investment. Were that part of the investment deducted which may be said to be borrowed money, chargeable only with a low fixed rate of return, the rate on the remainder, on that part which may be considered as put in by the stockholders, would be considerably higher.

Position in the industry.—While in production the Steel Corporation from the beginning has overshadowed its principal rivals, and even exceeded all of its competitors combined, its proportion of the total has materially diminished in the ten years of its operation.

In pig iron production, the Corporation has just about maintained its original position; in 1901, 43.2 per cent; in 1910, 43.4 per cent. But in steel, both crude and finished, it has lost ground; in 1901, 66 per cent of the steel ingots and castings; in 1910, only 54 per cent, notwithstanding great additions to its capacity. Rolled steel products generally show an almost steady loss, especially structural shapes and tin plate. Even in rails there has been no gain.

In short, speaking broadly, as against 60 per cent of all crude and finished steel production in 1901, the Corporation now has not much over 50 per cent, indicating conclusively the continuous presence of strong and increasing independent production. The competition of these independents with the Steel Corporation so far as prices are concerned has been modified by the policy of "cooperation." This will be discussed in a later part of the report.

In efficiency, location of plant, and equipment—in capacity rather than actual production—the Corporation is materially stronger than the foregoing figures indicate, and in case of continued trade depression this strength would probably show itself in increased control. In ownership of railroads for handling its materials it stands in a class by itself. It has a strong but not exceptional position in water transportation. Its control of the best qualities of coking coal is very strong, though modified of late by new processes which make other coal more or less available for coking purposes.

Its position in ore reserves, on the other hand, is much stronger than in any other factor in the business. It is almost impossible, and would be unwise, to attempt any quantitative statement of its proportion of the total ore of the country; but of the Lake ores, on which the present steel industry is based, it has about 75 per cent, and this advantage is materially enhanced by its extensive control of the rail transportation of the ore from the mines to the Lakes. The so-called Hill lease made by the Corporation in 1907, with an unprecedentedly high rate of royalty and other onerous conditions, is a striking instance of the policy of the Corporation to maintain a high degree of control of ore. This lease covered enormous ore holdings.

There is much significance, also, in the prevailing custom of leasing ore mines under royalty instead of purchasing outright. This system as applied in the Lake ore region, without any effective restrictions as to size of holdings, plainly facilitates concentration of ore property, as it greatly reduces the investment required to control large bodies of ore. It has unquestionably had a large influence in producing the high concentration of control now existing in Lake ores, as well as elsewhere.

Thus, the industry itself rests physically on the ore; the Corporation based one-half its capitalization on the ore; its profits on ore, as will later be shown, are large; and in the ore is its highest degree of concentration and control. The ore, therefore, is of primary significance in the Corporation's dominance, and in that resource chiefly are involved the industry's problems of ultimate public interest.

Very respectfully,

Herbert Knox Smith,
Commissioner of Corporations.

The President.

REPORT OF THE COMMISSIONER OF CORPORATIONS ON THE STEEL INDUSTRY.

Part I.—ORGANIZATION, INVESTMENT, PROFITS, AND POSITION OF THE UNITED STATES STEEL CORPORATION.

SUMMARY.

The principal features of this part of the Bureau's report upon the steel industry are:

1. The marked development of consolidation, culminating in the organization of the United States Steel Corporation.
2. Capitalization by the United States Steel Corporation far in excess of property values. The Bureau's valuation of the tangible assets in 1901 is $682,000,000, as against $1,400,000,000 of issued securities.
3. An analysis of the cost of the subsequent additions to the property of the Corporation, showing a total investment in tangible property on December 31, 1910, of $1,187,000,000, as against $1,468,000,000 outstanding securities.
4. An average rate of profit from 1901 to 1910 on the Corporation's actual investment, as computed by the Bureau, of 12 per cent.
5. An almost continuous decrease in the Corporation's proportion of the output of principal steel products, but a marked increase in its ownership or control of iron-ore deposits.

DEVELOPMENT OF CONSOLIDATION.

PERIOD PRIOR TO 1898 MARKED BY ACTIVE COMPETITION.

Prior to 1898 the iron and steel business of the United States was distributed among a very large number of interests. There was active and general competition. It is true that in the production of crude steel (ingots), semifinished steel (billets, slabs, sheet bars, etc.), and heavy finished steel products, such as rails, plates, and structural material, substantial prominence had been attained by a few companies. Furthermore, there were occasional instances of consolidation, notably the organization of the Illinois Steel Company in 1889 as a merger of several important steel concerns in Chicago and vicinity. The Carnegie Steel Company (Ltd.), moreover, while not generally considered a consolidation, had in its expansion taken on many features of a consolidation. Despite price agreements of more or less significance and duration these large steel-making companies were, as a rule, in active competition. With respect to such finished products as merchant bars, tubes, sheets, tin plate, wire, and wire nails, the number of manufacturers was large and rivalry between them was keen. In short, the distinguishing characteristic of the industry at this period was competition.

Another feature of the industry at this period was that most of the concerns making the lighter finished products just mentioned did not produce their own steel, but purchased it from the larger steel-making concerns. Again, even some of the largest of these steel-making concerns did not produce all of their pig iron, but bought extensively from "merchant" furnaces, and many of them were dependent upon the open market for their supplies of raw materials—ore and coal. On the other hand, the larger steel concerns, as a rule, did not engage extensively in the manufacture of finished lines, except for heavy and comparatively simple products, like rails, structural material, and plates, but instead sold a large part of their output of crude and semifinished steel to others for such elaboration. In other words, integration of the industry had not been carried very far at this early date.

RAPID PROGRESS OF CONSOLIDATION AFTER 1898.

The late nineties, however, witnessed a revolution in the business. One after another, great consolidations were formed in the principal branches of the industry. The result was that the beginning of 1900 found a very substantial proportion of the manufacture of crude and semifinished steel and of such finished products as rails, structural steel, plates, merchant bars, wire rods and wire products, sheets, tin plate, and tubes under the control of less than a dozen important consolidations.

One of the earliest of these mergers was the Federal Steel Company, incorporated in September, 1898. This was a consolidation of the Illinois Steel Company in the Chicago district; the Lorain Steel Company farther east; the Minnesota Iron Company, one of the largest ore concerns in the Lake Superior region (which also owned an important ore railroad and a fleet of ore vessels); and the Elgin, Joliet and Eastern Railway. Integration of the successive stages of production was the chief object of this consolidation. The issued capital stock of the new company was almost $100,000,000; and it secured, roughly, 15 per cent of the steel-ingot production of the country.

The National Steel Company, formed early in 1899, with $59,000,000 ssued capital stock, acquired the principal crude-steel manufacturing ompanies west of the Alleghenies (chiefly in Ohio) other than those wned by the Federal Steel Company and by the Carnegie Steel Company (Ltd.). Its ingot capacity was approximately 12 per cent of the ountry's total.

The Carnegie interests a little later underwent an important reorganization, which resulted in the incorporation in March, 1900, of the Carnegie Company of New Jersey, with a capitalization of $320,000,000 half of which was in bonds) to take over the old Carnegie Steel Company (Ltd.), and also the H. C. Frick Coke Company. Inasmuch as hese interests had long been affiliated, this reorganization was not a onsolidation of formerly competing concerns in the same sense as ome of the others here noted. At the time of the formation of the New Jersey concern the Carnegie interests controlled fully 18 per cent of the ingot production of the country.

These three concerns, the Carnegie, the Federal, and the National teel companies, were engaged chiefly in the manufacture of crude and semifinished steel for the trade, or of the heavier finished steel products, such as steel rails, beams, plates, and bars.

There was also a second group of consolidations, chiefly engaged in he manufacture of products which, while comparatively simple, involved somewhat more advanced processes of manufacture. One of hese, the American Tin Plate Company, was organized in December, 898, with $46,000,000 issued capital stock. It acquired practically very tin-plate concern in the country, giving it an almost complete monopoly of that branch of the industry. The American Steel and Wire Company, organized a month later, with $90,000,000 capital tock, secured all the leading concerns engaged in the production of wire, wire nails, and other wire products. The National Tube Company, formed in June, 1899, with $80,000,000 capital stock, acquired oncerns controlling the bulk of the production of iron and steel wrought tubing. A somewhat smaller consolidation of 1899 was the American Steel Hoop Company, capitalized at $33,000,000, a merger of the principal concerns making hoop steel, especially cotton ties.

Early in 1900 the American Sheet Steel Company was organized, with $49,000,000 issued capital stock, to take over the principal manufacturers of steel sheets. The American Bridge Company, ormed in April, 1900, with $61,000,000 issued capital stock, conrolled the great bulk of the heavy bridge construction business of he country, aside from other structural work. The Shelby Steel Tube Company, a less important concern incorporated in February, 900, with $13,150,000 issued stock, may also be mentioned. It had substantial control of the seamless tubing industry.

All of these companies were later merged into the United States Steel Corporation.

Certain other important consolidations should be also mentioned, which did not enter that combination. One of these was the Republic Iron and Steel Company, organized in 1899, with $47,500,000 issued stock, a consolidation of the principal manufacturers of rolled iron products in the Middle West; it also had some southern plants. In the South there was the Sloss-Sheffield Steel and Iron Company, with $14,200,000 issued capital stock, a consolidation of various furnace interests in Alabama. This company did not make steel.

Concurrently with the formation of these consolidations there occurred an expansion of several older concerns. Thus the Pennsylvania Steel Company, which had an important plant in eastern Pennsylvania and another near Baltimore, in 1901 increased its issued capital stock from $6,500,000 to $27,250,000 and materially extended its manufacturing operations. The Cambria Steel Company was organized in 1898 to lease the old Cambria Iron Company with a plant at Johnstown, Pa. It had an issued capital stock of $16,000,000, this being later increased to $45,000,000. The Lackawanna Iron and Steel Company, capitalized at $3,750,000, determined at the close of 1899 to abandon its old plant at Scranton, Pa., and was succeeded in 1902 by the Lackawanna Steel Company, of New York, with $40,000,000 authorized capital stock (since increased). This company erected a new and much larger plant on Lake Erie, near Buffalo. The Jones & Laughlin interests, whose plants were in the Pittsburg district, reincorporated in 1902 as the Jones & Laughlin Steel Company, with $20,000,000 capital stock (since increased to $30,000,000 aside from a large issue of bonds).

Aside from these reorganizations of leading iron and steel concerns, mention may be made of a steady expansion in operations by such old establishments as the Colorado Fuel and Iron Company in the West and the Tennessee Coal, Iron and Railroad Company in the South. These concerns were, moreover, virtually reorganized at a somewhat later date.

All of these concerns, except the Tennessee company (acquired in 1907), have remained outside the Steel Corporation.

GENERAL CAUSES OF CONSOLIDATION.

The transformation in the steel industry, thus far described, was simply one phase of a general movement toward industrial consolidation at the time. This movement was characterized in varying degree by three especially important features, as follows:

(1) The restriction of competition through combination.

(2) Integration; that is, the linking up of productive processes through acquisition under one control of raw materials and manu-

facturing plants (and in some cases transportation facilities) and through extensions and coordination of manufacturing processes.

(3) The creation of a great amount of inflated securities.

The influence of all these factors should be kept clearly in mind. The first, namely, the restriction or elimination of competition, was the most important. Undoubtedly it was the principal cause of most consolidations in the steel industry. Profits had been sharply reduced by the severe competition which accompanied the depression of the middle nineties, and steel manufacturers were attracted to consolidation as a means of increasing their returns. Indeed, the organizers of some of these consolidations have admitted that the desire to control or eliminate competition was the chief reason for combination.

However, a desire to secure greater economies and advantages through integration undoubtedly played an important part in the movement. This was especially true of the steel business, where such integration has been introduced to an exceptional degree, extending from ownership and production of the primary raw materials to the manufacture of the finished product. A conspicuous feature of this was the acquisition by large iron and steel manufacturers of extensive reserves of raw materials—ore and coal. One of the chief advantages to be gained was the saving of the payment of profits to others on such materials. In the case of ore in particular this was an important consideration because of the rather effective control of ore prices from time to time by ore pools. Whereas in the beginning of the nineties most manufacturers, as already stated, were largely dependent upon the open market for their requirements of ore, by the close of the decade, as a result of this change, the control of large ore reserves had come to be regarded as essential to successful continuance in the industry. The great bulk of the iron-ore deposits of the Lake Superior region had by 1900 passed under the control of less than a dozen interests, chiefly steel-making concerns. The most desirable coking-coal fields of the East had been secured, largely by the same steel-making interests, with almost equal rapidity.

Along with this acquisition of supplies of raw materials went a marked integration of manufacturing processes.

Such integration and coordination of the industry, aside from eliminating the payment of profits to others, made possible the introduction of many economies in the manufacture of steel products, particularly in the saving of fuel and labor. In considering the general causes which led to consolidation in the steel business, therefore, this element of integration should be given due weight.

Restriction of competition and integration of industry were, however, by no means wholly responsible for the rapid progress of consolidation. The creation of new securities for the sake of a stock-market profit was a very important consideration. The public demand for such securities was unusually active at this time. Indeed, the proportions of this movement were largely determined by the opportunity to market the securities thus created. So long as the demand for such issues was maintained the supply was steadily increased.

The importance of this stock-market factor in the consolidation movement, whether in the iron and steel industry or in other industries, is too often overlooked. Consolidation, while in large measure an outgrowth of technical and industrial conditions, was by no means exclusively so. Instead, there was frequently a marked reluctance on the part of owners to dispose of the businesses which they had built up, and in many cases the controlling inducement to sell out was the enormous price obtainable in the securities of these great consolidations.

The consolidation of wire interests is a conspicuous illustration of the great inflation of capitalization thus brought about. In the organization of the American Steel and Wire Company of Illinois, in March, 1898, each $100 of the stock of the Consolidated Steel and Wire Company, one of the constituent concerns (and itself a consolidation of seven plants) received $175 of preferred stock and $175 in common stock of the new company, or $350 of new securities for every $100 of old. Undoubtedly the stock of the Consolidated Steel and Wire Company was worth considerably more than par from the standpoint of earnings. A few months later each $100 of the preferred stock of the American Steel and Wire Company of Illinois received $100 in preferred stock and $60 in common stock of the American Steel and Wire Company of New Jersey, while each $100 of the Illinois company's common stock received $120 in common stock of the new concern. Thus each $100 stock of the old Consolidated company became $490 in the stock of the New Jersey concern. (Still later, in the merger of the American Steel and Wire Company of New Jersey into the United States Steel Corporation, there was some further increase.)

A noteworthy feature of this general inflation of securities was the heavy stock commissions received by the promoters of these consolidations as their compensation. In the case of the American Tin Plate Company $10,000,000 of common stock admittedly went to the organizers, and in the case of the National Steel Company and also of the American Steel Hoop Company at least $5,000,000. In the organization of the American Steel and Wire Company $11,600,000 of the common stock went to the promoters and underwriters. In the organization of the National Tube Company $20,000,000 of common stock appears to have been issued as a commission to the promoters or bankers, and in the case of the American Bridge Company at least $7,250,000 of common stock, and possibly twice that amount. The underwriting syndicate of the Federal Steel Company received approximately $5,680,000 preferred stock and $8,400,000 of common stock in return for approximately $4,800,000 cash and their services in organizing that concern. There were similar large payments in the case of some others of these steel consolidations. In the case of the Carnegie Company apparently no commission was paid, the reorganization of this concern being handled by the former owners without the assistance of outsiders.

Out of the proceeds of such stock commissions frequently some organization expenses had to be met, but in the main these commissions were intended as compensation to the promoters of these consolidations. It should be noted that the size of these commissions frequently was fixed by the promoters themselves, since they determined the capitalization of the consolidated company.

CAUSES OF THE FORMATION OF THE UNITED STATES STEEL CORPORATION.

The fundamental causes for the formation of the United States Steel Corporation were substantially the same as those which gave rise to the earlier consolidations already described, namely, restriction or prevention of competition; integration; stock inflation. The same causes, though in varying degree, were here present, and the same processes were here repeated, though in a more comprehensive manner and on a vaster scale.

A striking and surprising result of the consolidation movement in the late nineties, just described, was that while several of the great steel consolidations aimed to and did secure a substantial degree of monopoly of their particular branches of the business, nevertheless competition was not thereby destroyed. Instead, it soon developed that the formation of these great consolidations was likely to bring on an era of competition more severe than any the industry had yet seen. The reason for this is plain. At the bottom, such "particular branches" were not essentially separate. In the commercial and technical development of the business they tended naturally to overlap. In other words, this unforeseen outcome of consolidation was largely due to the tendency of these great concerns to secure greater integration, to make themselves virtually independent in all stages of production from the ore up.

The conditions were quite remarkable. Competition was threatening to break out in much more violent form in the steel industry. On the other hand, the upward swing of business in the United States had not exhausted its vigor, and the readiness of the business world to support vast commercial and financial undertakings was unabated.

Thus the industrial situation presented an extraordinary motive to form a great merger, as well as to avert imminent competition.

The active integration movement, furthermore, presented another very serious consideration. The extensions made by the crude-steel makers into the territory of those manufacturing more finished products, and vice versa, meant not only increased competition, but also a sudden and great increase in the productive capacity for crude steel and steel products, an increase that might place production, for some time at least, far beyond the country's power of consumption. The leading men connected with the steel industry feared such over-investment in plant, which might, they felt, seriously disturb general industrial and financial conditions. Again, they feared the breaking down of the extremely profitable quasi monopolies already established.

INDUSTRIAL SITUATION.—As these conditions were the most critical factors in the position of the steel industry at the close of 1900 and the beginning of 1901, it is necessary to recite them in some detail.

Taking first what may be called the "primary" group of consolidations, namely, those producing crude and semifinished steel: The Carnegie Company was the most important of these. It depended for marketing its semifinished steel products on other manufacturers for whom these products were raw materials. As to its own raw materials it was quite independent, with vast holdings of iron ore and coking coal, as well as extensive transportation properties.

The Federal Steel Company was in much the same general position as the Carnegie, and integrated to a similar degree, though without quite as strong an organization or financial condition.

The National Steel Company (a "Moore" concern) was, like the other two, partly dependent on other manufacturers for a market for its products, but this company had a peculiar advantage through its intimate relations with the rest of the so-called "Moore" concerns, the Sheet, Tin Plate, and Hoop consolidations. It was also integrated to a degree comparable with that of the other two.

A very important concern closely related to this primary group of steel-making companies was the Lake Superior Consolidated Iron Mines, with great holdings of ore in the Lake region, an ore railroad to the upper Lake ports, and an affiliated fleet of ore vessels. It was not a manufacturing concern.

The "secondary" group consisted of those concerns making the more finished products.

Of these, the American Steel and Wire Company at its organization had a substantially monopolistic control of wire products. It was not, however, strong in its raw materials, namely, steel billets, although subsequent to its organization it did acquire iron ore, coal property, and a vessel fleet; but it was by no means completely integrated in 1900.

The National Tube Company at its formation controlled the greater part of the country's production of wrought pipe and tubes. Two of its chief plants were fairly well integrated. The company, however, purchased a large part of its crude steel.

The American Bridge Company handled a large part of the country's business of heavy bridge construction, but depended almost entirely on other concerns for its raw material, structural steel, particularly on the Carnegie Company.

The American Sheet Steel, American Tin Plate, and American Steel Hoop companies were all "Moore" concerns. They largely controlled their lines of production, but were integrated to only a small extent. All three, however, being affiliated, as stated above, with the National Steel Company (the crude-steel concern of the "Moore" companies), were thus protected to a certain extent as to the supply of their raw materials.

This general situation was obviously one of transition, of change, in view of the prevailing movement toward complete integration, and the resulting invasion of these great concerns into each other's business field. And the change promptly came. In particular, the so-called "secondary" concerns began to extend their business backward to the production of pig iron and crude steel and the mining of raw materials. This tended to lessen the market and injure the primary concerns, particularly the Carnegie Company, and to a less degree the Federal Steel Company.

For example, the American Steel and Wire Company, the constituent concerns of which had previously bought most of their supply of billets or wire rods from either the Federal Steel Company or the Carnegie company, planned in 1900 to make its own pig iron and steel.

The National Tube Company, which had bought a large part of its raw materials from the Carnegie concern, proposed to erect additional blast furnaces and steel works.

The "Moore" companies (National Steel, Tin Plate, Sheet Steel, and Steel Hoop) were rapidly making themselves independent through the enlargement of the crude steel capacity of the National Steel Company. This latter concern, moreover, secured extensive ore and coal properties and a fleet of Lake ore vessels. The constituent companies of these Moore concerns had formerly bought large amounts of steel from the Carnegie and other "primary" companies.

The obvious result of these extensions was that the Carnegie Company and to a less degree the Federal Steel Company saw the danger of the loss of a part of their market for semifinished steel, and the probability that their former best customers would become their rivals. These "primary" concerns, therefore, promptly entered upon a policy of retaliation. The Federal Steel Company prepared to take up the manufacture of several finished products, particularly structural material, tubes, and universal plates. The Carnegie interests also considered building new finishing mills.

Finally, at the close of 1900, the Carnegie interests announced that they would erect an immense tube plant on the shores of Lake Erie. Mr. Carnegie stated that this move was largely the result of the plans of the National Tube Company to provide its own supplies of crude steel.

As already shown, the economic forces at work in the industry at that time, particularly the general tendency toward integration, clearly foreshadowed a period of competition and duplication of capacity. Under these circumstances this aggressive move of the Carnegie interests precipitated a crisis. Conditions in the steel industry were unsettled. Both the daily press and trade journals were actively discussing the coming "battle of the giants."

INTERESTS OF FINANCIERS.—This critical trade situation was intensified because of the importance which the securities of several of these steel concerns had assumed on the stock market. A period of violent competition in the steel industry would inevitably have been followed by a great decline in the value of these securities. This would have been very embarrassing to the financial groups which were behind these consolidations. A more important matter was that the financial backers of some of these steel concerns had extensive commitments in other directions, which might be jeopardized by such an acute struggle in the steel industry. From the standpoint of these financiers, therefore, the situation presented at once a great danger and a great opportunity.

From a financial point of view there were four important groups, which were more or less distinct, namely, "Morgan," "Moore," "Carnegie," and "Rockefeller."

The Morgan group, which included the Federal Steel, National Tube, and American Bridge companies, enjoyed of course the advantage of a strong financial support, but these financial interests were extensively committed in other lines of business, especially in railroad financiering. It may be noted that there were reports at this time that the Carnegie interests were contemplating the construction of a railroad from Pittsburg to the Atlantic seaboard. This threat, if made good, would have created an extremely disturbing factor in the trunk-line situation.

The Moore concerns, already described, were the most heavily overcapitalized and suffered from a distinctly speculative backing.

The Carnegie interests were apparently in the best position of any of these groups to meet a price war. They had abundant capital and credit, and their securities did not figure on the stock market, while their organization and management were unequaled.

The Rockefeller interests were entirely concerned with the production and transportation of iron ore. Their financial resources were of course abundant for any emergency. Their stocks did not figure to any considerable degree on the exchanges.

The American Steel and Wire Company apparently was not closely affiliated with any of the foregoing groups.

It is evident, therefore, that, both from the point of view of the iron and steel industry and that of the stock market, there was a great inducement to avert the threatened outbreak of violent competition between these rival interests. A steel war might have meant the sudden end of the extraordinary period of speculative activity and profit. On the other hand, an averting of this war, and the coalition of the various great consolidations, if successfully financed, would be a tremendous "bull" argument. It would afford its promoters an opportunity for enormous stock-market profits through the sale of its securities. The advantages to these interests also, through the concentration of profits in different stages of the industry under a single control, were considerable, and there was undoubtedly some advantage to be gained through the further integration which such a consolidation would render possible.

It was clear to everyone that no consolidation of this sort could be made successful unless it included the Carnegie Company, which was the most powerful factor in the situation, which had long been noted for its aggressive tactics, and which, as above shown, had precipitated this crisis. Moreover, there can be little doubt that many interests in the steel industry regarded Mr. Carnegie's personal influence as a menace to themselves and their businesses, and desired to secure his retirement from the trade. The primary solution of the situation, therefore, from the standpoint of these interests, was to buy out Mr. Carnegie. It was realized that this would be an extremely expensive transaction, which would require the cooperation of the leading interests. The purchase of that concern obviously could not be financed with cash. Arrangements were, however, effected with Mr. Carnegie for taking over his large holdings in his company in exchange for bonds of the new consolidation.

The threatened "steel war" was thus averted after only a few weeks of negotiation, as a result of which the United States Steel

Corporation was formed, and acquired, on April 1, 1901, or shortly thereafter, the following concerns:

Acquired April 1, 1901:
- Carnegie Company (of New Jersey).
- Federal Steel Company.
- American Steel and Wire Company.
- National Tube Company.
- National Steel Company.
- American Tin Plate Company.
- American Steel Hoop Company.
- American Sheet Steel Company.

Acquired subsequently in 1901:
- American Bridge Company.
- Lake Superior Consolidated Iron Mines.
- Bessemer Steamship Company.
- Shelby Steel Tube Company.

Further important acquisitions were made later, as noted hereafter.

By this merger substantially two-thirds of the steel-ingot production, and a proportion of the principal rolled-steel products of the country, varying from one-half to four-fifths, or more, was transferred to the control of a single concern. The Steel Corporation's share of the total pig-iron production was only about 43 per cent. However, of the output of steel-making pig iron of the country, the Corporation's share was not less than 58 per cent.

The position taken by the Steel Corporation is that this great aggregation of property was in the main an assembling and coordination of different branches in the industry, the primary object of which was to secure greater efficiency and integration, and, of course, saving of the payment of profits to others. Their contention is that most of the constituent concerns of the Corporation were not in actual competition with one another, and they are disposed to minimize the restriction of competition brought about as a result of this great merger.

It is true that certain of the constituent consolidations, as, for instance, the American Steel and Wire Company and the National Tube Company, were not competing with one another at this particular period. However, there was active competition between the three principal crude-steel concerns—the Carnegie Company, the Federal Steel Company, and the National Steel Company—while these concerns, to some extent at least, were in competition with some of the large consolidations making the lighter finished products. Moreover, the fact should not be lost sight of that nearly all of the latter class of consolidations were originally created with the intention of restricting competition. A more important matter is that a period of violent competition among all of these concerns was imminent at this juncture, and that the United States Steel Corporation was organized for the specific purpose of preventing the new competition thus threatened as well as eliminating that already existing among these concerns. The opportunity for reaping a huge promoter's profit out of this situation undoubtedly was an important consideration in bringing about the merger. Nevertheless the primary object was the restriction or prevention of competition.

Several of the largest iron and steel concerns which were not absorbed by the Steel Corporation were at that time engaged in the manufacture of special products which did not bring them into sharp conflict with the Corporation, or confined their activities to a more limited field than that of the Corporation. The failure of the Corporation to include some of these concerns was, therefore, less significant than might at first sight appear. However, several of the concerns remaining outside, notably the Jones & Laughlin interests, the Lackawanna Iron and Steel Company, the Republic Iron and Steel Company, the Pennsylvania Steel Company, and the Cambria Steel Company, were important rivals of the Corporation. The Colorado Fuel and Iron Company in the West, on account of its geographical location, was not a serious competitor. Nevertheless, negotiations were entered into shortly after the organization of the Steel Corporation for the acquisition of that concern, but were not consummated. The Tennessee Coal, Iron and Railroad Company in the South was at this time chiefly concerned with the production of foundry pig iron. As noted below, this concern was acquired by the Steel Corporation in 1907.

DESCRIPTION OF THE UNITED STATES STEEL CORPORATION IN 1901.

Some idea of the magnitude of the Steel Corporation, as well as of its character as a consolidation of combinations, is brought out by Table 3, facing page 107, which gives its principal constituent companies in 1901, with the subsidiaries of these at that date, or the principal properties, where the ownership was in fee instead of by stock.

At its organization the Corporation acquired steel works with an annual capacity of over 9,400,000 tons of crude steel and more than 7,700,000 tons of finished rolled steel products; several railroads, with over 1,000 miles of main track and a large mileage of second track and sidings; a fleet of 112 Lake ore vessels; iron-ore reserves in the Lake region estimated at about 500,000,000 to 700,000,000 tons (see p. 28); more than 50,000 acres of coking-coal lands with a great acreage of other grades of coal, not to mention numerous miscellaneous properties.

SUBSEQUENT ACQUISITIONS AND ADDITIONS.—Since its organization the Steel Corporation has very greatly increased the capacity of its plants and the scope of its operations. The bulk of this increase has been due to the construction of new plants, or the enlargement of old ones, the acquisition of additional ore and coal properties, and similar extensions, such additions being paid for largely from earnings.

The Corporation, however, has made three important acquisitions of competing concerns since 1901. The first of these was the purchase in December, 1902, of the Union Steel Company, which had just absorbed the Sharon Steel Company. This concern was located in the Pittsburg district and was an aggressive competitor in several branches of production in which the Steel Corporation was actively engaged. It also had a valuable ore property. The company was backed by very influential interests, including H. C. Frick, and it was desired by the Steel Corporation for these reasons even more than for its properties.

In May, 1904, the Corporation purchased the Clairton Steel Company, a somewhat smaller concern. It was in the hands of receivers at the time of its acquisition.

The third and most important of these acquisitions was the Tennessee Coal, Iron and Railroad Company, in 1907. By the purchase of this company the Steel Corporation secured the leading factor in the southern iron and steel industry (the Tennessee concern having by this time erected steel works of considerable capacity), and, what was of more consequence, the extensive ore and coal reserves of that company. The purchase of this concern, which was made in the height of the panic of 1907, had been preceded by unsuccessful attempts on the part of other interests to use it as a basis of a rival consolidation which would also include the Sloss-Sheffield Steel and Iron Company and the Republic Iron and Steel Company.

CAPITALIZATION AND INVESTMENT OF THE UNITED STATES STEEL CORPORATION IN 1901.

The relation of the assets and actual investment of this great combination to the securities issued is of high public importance in estimating both the status of the Corporation itself, the reasonableness of its profits, and its other effects on the interests of the public.

The Corporation in 1901, after its organization had been fairly completed (and including the acquisition of the Shelby Steel Tube Company, which did not occur until August), had a total outstanding capitalization, including underlying bonds, sundry mortgages, and purchase-money obligations (but excluding $535,407 unacquired stock of subsidiaries), as follows:

Preferred stock	$510, 205, 743
Common stock	508, 227, 394
Steel Corporation bonds	303, 450, 000
Underlying bonds	59, 091, 657
Purchase-money obligations and real-estate mortgages	21, 872, 023
Total	1, 402, 846, 817

For the purposes of the Bureau's investigation it was essential to make an analysis of the actual value of the physical properties of the Corporation in 1901, upon which this huge capitalization was based. The Bureau has made such an analysis by three different methods:

First, by organization history—that is, from historical study of the organization and investment of the constituent concerns at the time of their formation.

Second, by market value of securities—that is, by computation of the public estimate of the value of the properties of those constituent concerns as reflected in the market prices of their securities.

Third, by departments of business—that is, by a detailed estimate of the physical properties of the company by departments of its business, computed from all available data and with an especially elaborate calculation of the value of the ore property.

The valuation arrived at by the Bureau by the first method, which is chiefly for tangible assets, is approximately $676,000,000; the valuation arrived at by the second method, which includes intangible considerations, is approximately $793,000,000; the valuation arrived at by the Bureau by the third and more precise method, this being for tangible assets only, is approximately $682,000,000.

None of these valuations includes any value imparted to these properties by the very act of merging them into the Steel Corporation and treating them as a unified going concern. Obviously such a value must be largely due to the element of concentration of control and consequent elimination of competition, which value should not be included in the present discussion. (See p. 50.)

It may be noted at this point that the United States Steel Corporation is a holding company, practically its entire property consisting of the securities of a number of subsidiary concerns, some of which, moreover, in turn own stocks in underlying concerns. For the sake of brevity and clearness in this report, however, it will be convenient to refer to the physical properties thus controlled as though they were directly owned by the Corporation itself. For all practical purposes such is indeed the fact.

ESTIMATED VALUE OF CORPORATION'S PROPERTY, BASED ON STUDY OF ORGANIZATION OF CONSTITUENT CONCERNS.

The Bureau's estimate of the value of the Steel Corporation's property, arrived at by a study of the organization of the constituent concerns—approximately $676,000,000—includes the entire physical property and not merely the equity over and above bonded indebtedness (which indebtedness, for these constituent concerns, is assumed to represent an equivalent investment in property). It includes only a negligible allowance for intangible considerations.

In the main the valuations arrived at are based upon the method by which these constituent companies were organized. A very common basis of organization was to determine upon cash prices for the plants acquired and then to give the vendors (the owners of the plants) the option of taking the price in cash or of taking preferred stock up to the full amount of the cash option figure, with a large bonus in common stock. New cash capital frequently was raised on the same terms. The result of this method of organization was that the preferred stock of the consolidated concern at its original organization represented practically the entire value of the property acquired—certainly the entire value of the physical assets.

This was the method followed in the four "Moore" companies, viz, National Steel Company, American Tin Plate Company, American Sheet Steel Company, and American Steel Hoop Company.

In the case of at least three of these companies a considerable block of the common stock was issued to the promoters as a "commission" for their services; in the case of the American Sheet Steel Company apparently some preferred stock was also issued for this purpose.

In the organization of the American Steel and Wire Company the preferred stock likewise covered the entire value of the physical property acquired at the time of organization, all of the common stock being issued either as a bonus or for underwriting services. The same method, substantially, was followed in the organization of the National Tube and American Bridge companies.

The common stock of the Federal Steel Company, however, appears to have had some property value back of it. Taking its principal subsidiary concerns, the Illinois Steel Company and the Minnesota Iron Company, at their book values—roughly $19,250,000 and $22,950,000, respectively—and allowing $4,000,000 to cover its Lorain and Johnson companies (this being approximately the price paid, reduced to a cash basis), and $4,200,000 for the $6,000,000 stock of the Elgin, Joliet and Eastern Railway, the total indicated property value (over and above underlying indebtedness), including the net amount of new cash capital provided, was, roughly, $62,100,000 against which the Federal company issued, approximately, $99,700,000 of stock. The Bureau has allowed as an outside figure a total of $63,000,000. The method of arriving at this valuation is carefully explained in the text of the report. While made independently, it very closely agrees with the average stock market valuation of Federal Steel stocks during the period from September, 1898, to December 31, 1900.

The valuation of the Carnegie Company's property is more difficult because the organization of this concern was arranged privately by the former owners, and because its securities were never actively dealt in. The book value of the property of the old Carnegie Steel Company

(Ltd.) (which had approximately a 29½ per cent interest in the H. C. Frick Coke Company) on March 1, 1900, or just before these two concerns were transferred to the Carnegie Company of New Jersey, was, roughly, $81,500,000. This book value, while correct for some of the properties of the company, undoubtedly understated the value of others, particularly the item of "investments." Using such data as were available, the Bureau has arrived at the conclusion that the tangible property of the Carnegie concern in March, 1900, was not in excess of the $160,000,000 bond issue (the company also issued $160,000,000 of stock). A suggestive fact is that in organizing the New Jersey company $125,000,000 of bonds, and a like amount of stock, were allotted for the various Carnegie steel properties, and $35,000,000 of bonds and an equal amount of the stock for the H. C. Frick Coke Company. This clearly is analogous to a similar distribution of preferred and common stock in the case of several of the other constituent concerns of the Steel Corporation. These terms, in connection with other evidence presented in the body of the report, indicate that the Carnegie interests issued bonds up to substantially the full amount of tangible property, leaving the stock to cover intangible considerations.

The Lake Superior Consolidated Iron Mines has been entered in the Bureau's estimate at a value equal to the par of its outstanding stock, approximately $29,400,000. This appears to be sufficiently liberal. In the middle nineties the stock sold as low as $10 per share (par $100); in 1899 it sold as low as $40 per share, and the highest reported price in 1900 was $75 per share, the sales being very infrequent. While the market price may have been depressed by the fact that the company had never paid a dividend and did not publish annual reports, these figures apparently do not warrant a valuation of the property of this concern in excess of the par value of its stock.[1]

The Shelby Steel Tube Company, acquired in August, 1901, was purchased for $1,791,038 preferred and $2,004,550 common stock of the United States Steel Corporation. This covered practically the entire stock of the Shelby concern. The current market value of the Corporation's stock thus issued was approximately $3,000,000, and this figure has been taken as representing the value of this company at its acquisition rather than the par value of the preferred stock ($5,000,000), as in several other cases.

The Bessemer Steamship Company has been entered in the Bureau's estimate at $8,500,000, the purchase price, this acquisition being temporarily financed by the issue of purchase-money obligations to that amount.

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[1] The Bureau has, however, added the moderate surplus of the company on April 1, 1901, this being included in the item of $117,700,000 in the table on page 19. (See also Table 12, p. 167.)

The Steel Corporation also acquired a one-sixth interest in the Pittsburg Steamship Company and the Oliver Iron Mining Company (the other five-sixths interest in these concerns already being owned by the Carnegie Company; also, of course, acquired by the Corporation). Owing to the difficulty of estimating ore property in small parcels, this one-sixth interest in the two concerns has been credited in the current estimate with a value equal to the par of the United States Steel preferred stock issued therefor—namely, $9,250,000—(an equal amount of common stock was also paid; this has been regarded as a bonus). While this allowance is undoubtedly too high, the excess over a more accurate valuation is relatively so small as not to be important.

The foregoing valuations, it should be kept in mind, are applicable at the dates of the respective organizations of the companies named, except in the case of the last four concerns, where the figures given apply to the dates of acquisition by the Steel Corporation. By April, 1901, the various constituent concerns had increased their property investment, through surplus earnings, to the extent of approximately $117,700,000. Adding this sum, together with $25,003,000 new cash capital provided the Steel Corporation, to the valuations stated above and including underlying bonds, purchase-money obligations, and real-estate mortgages (which also cover any additions to the property made in this way), brings the indicated total investment in the physical property acquired by the Steel Corporation in 1901 up to approximately $676,000,000, as shown by the table on the succeeding page.

ESTIMATED VALUES OF TANGIBLE ASSETS OF CONSTITUENT CONCERNS OF THE UNITED STATES STEEL CORPORATION AT THE DATES OF THEIR RESPECTIVE ORGANIZATIONS, WITH ADDITIONS TO APRIL 1, 1901.

[Tentative estimate; for final estimate see p. 36.]

Constituent concerns.	Estimated values of tangible assets at dates of respective organizations.
Carnegie Company (New Jersey)	$160,000,000
Federal Steel Company	63,000,000
American Steel and Wire Company (New Jersey)	40,000,000
National Tube Company	40,000,000
National Steel Company	27,000,000
American Tin Plate Company	18,325,000
American Steel Hoop Company	14,000,000
American Sheet Steel Company	17,000,000
American Bridge Company	[1] 31,374,000
Lake Superior Consolidated Iron Mines	[1] 29,400,000
Shelby Steel Tube Company	[1] 3,000,000
One-sixth interest in Pittsburg Steamship Company and Oliver Iron Mining Company	[2] 9,250,000
Total	452,349,000
Add underlying bonds, mortgages, and purchase-money obligations of above companies at par	[3] 60,000,000
Total valuation at time of organization of constituent companies (except in cases noted)	512,349,000
Add:	
Surplus earnings of the companies acquired	117,727,000
Investment through bond issues, purchase-money obligations, etc	[3] 20,964,000
Cash capital provided	25,003,000
Approximate grand total of value of physical property in April, 1901	676,043,000

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[1] Estimated value of property at time of its acquisition by the United States Steel Corporation, instead of at its organization.

[2] Amount of preferred stock of United States Steel Corporation issued therefor; this probably excessive, but allowed here in absence of other data.

[3] The total of such indebtedness, $80,964,000, is known; the division here given was partly approximated. The item of $20,964,000 includes the Bessemer Steamship Company.

VALUATION OF CONSTITUENT COMPANIES AS INDICATED BY MARKET PRICES OF THEIR SECURITIES.

The valuation of the properties of these constituent concerns arrived at by the second method of analysis is based upon the market value of their securities. Using average weekly prices, where available, and again adding underlying bonds, purchase-money obligations, and real-estate mortgages, at par, as well as $25,003,000 of new cash capital provided for the Steel Corporation, the indicated valuation is approximately $793,000,000, as shown in the table on the next page.

APPROXIMATE MARKET VALUATION OF SECURITIES ACQUIRED BY UNITED STATES STEEL CORPORATION IN 1901, AS INDICATED BY AVERAGE MARKET PRICES, 1899-1900.

Constituent concerns.	Amount of stock acquired by United States Steel Corporation.	Average market price of stock in 1899-1900.	Value at average price.
Stocks regularly quoted:			
Federal Steel Company—	*Par value.*	*Per cent of par value.*	
Preferred	$53,260,200	76.38	$40,680,141
Common	46,483,700	50.04	23,260,443
American Steel and Wire Company—			
Preferred	39,999,000	89.41	35,763,106
Common	49,981,400	48.26	24,121,024
National Tube Company—			
Preferred	40,000,000	94.20	37,680,000
Common	40,000,000	48.72	19,488,000
National Steel Company—			
Preferred	26,996,000	91.16	24,609,554
Common	31,970,000	41.67	13,321,899
American Tin Plate Company—			
Preferred	18,325,000	84.77	15,534,103
Common	28,000,000	34.77	9,735,600
American Steel Hoop Company—			
Preferred	14,000,000	77.34	10,827,600
Common	19,000,000	32.11	6,100,900
American Bridge Company [1]—			
Preferred	31,357,600	93.10	29,193,926
Common	30,946,400	43.88	13,579,280
Shelby Steel Tube Company [1]—			
Preferred	4,776,100	56.48	2,697,541
Common	8,018,200	10.90	873,984
Stocks not actively quoted:			
American Sheet Steel Company [1]—			
Preferred	24,499,600	[2] 65.88	16,140,336
Common	24,499,600	[2] 19.00	4,654,924
Lake Superior Consolidated Iron Mines	29,413,905	[3] 75.00	22,060,429
Carnegie Company:			
Bonds	159,450,000	105.00	167,422,500
Stock	160,000,000	[4] 100.00	160,000,000
Oliver Iron Mining Company, one-sixth interest	200,000		[5] 9,250,000
Pittsburg Steamship Company, one-sixth interest	221,700		
Total	[6] 881,398,405		686,995,290
Mortgages and purchase-money obligations			21,872,023
Underlying bonds and scrip at par			59,091,657
Cash capital			[7] 25,003,000
Grand total			792,961,970

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[1] No quotation in 1899.

[2] Mean of highest and lowest prices in Pittsburg market in 1900, weekly quotations not being available.

[3] Asked price in 1900. Does not include lower prices recorded in 1900.

[4] Only 13 shares known to have been sold in open market.

[5] Not based on stock quotations but amount of United States Steel Corporation preferred stock issued therefor at par.

[6] Does not include $535,407 unacquired stock in subsidiary concerns.

[7] Including $3,000 paid in by original incorporators.

The average prices given cover the periods from the respective dates of organization to December 31, 1900. The market quotations from January 1, 1901, to March 31, 1901, were so largely influenced by the prospective organization of the Steel Corporation that they have been properly excluded in computing the foregoing averages; their inclusion, however, would have added only about $6,000,000 to the grand total reached.

It should be noted that the stocks of several of these concerns were inactive, particularly those of the Carnegie Company and the Lake Superior Consolidated Iron Mines. The former stock has been taken at its par value, since the few recorded sales of the stock (but 13 shares in all) were at that figure. The Lake Superior Consolidated stock has been taken at $75 per share—the highest reported figure for a number of years prior to 1901—since, on account of the inactivity of this stock, an average of the prices in 1899 and 1900 might be unfair. (In the preceding estimate the stock was reckoned at par.)

The Carnegie bonds have been entered at their market quotation. Although the premium on these securities might fairly be ignored in a calculation of this sort, it was deemed better to allow it.

When it is taken into consideration that these market prices include, of course, an allowance for earning power and other intangible considerations, this total of $793,000,000 indicates that the preceding valuation of $676,000,000 for the tangible property alone is sufficiently liberal.

ESTIMATED VALUATION OF PROPERTY OF STEEL CORPORATION IN 1901 BY DEPARTMENTS OF ITS BUSINESS.

Both of the foregoing estimates are necessarily somewhat general. The estimate of the Bureau, based on the third method stated—that is, by departments of the Corporation's business—was prepared on a more detailed basis.

Before proceeding to discuss this estimate, it should be noted that the Steel Corporation itself, in July, 1902, in litigation then pending, submitted an estimate of the value of its assets, by principal departments, as follows:

ESTIMATE OF VALUE OF TANGIBLE ASSETS OF UNITED STATES STEEL CORPORATION ON JULY 1, 1902, SUBMITTED BY THE CORPORATION IN THE "HODGE" SUIT.

Ore properties	$700,000,000
Plants, mills, fixtures, machinery, equipment, tools, and real estate	300,000,000
Blast furnaces	48,000,000
Coal and coke	100,000,000
Transportation properties	[1] 80,000,000
Natural gas fields	20,000,000
Limestone properties	4,000,000
Cash and cash assets [2]	148,291,000
Total	1,400,291,000

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[1] President Schwab stated that the Corporation's estimate for this item was the value after allowing for $40,340,000 of indebtedness. (See p. 36.)

[2] As of June 1, 1902. See note 3 to table on page 36.

This estimate of the Steel Corporation was submitted for the purpose of defending its huge capitalization, which was then directly challenged as one of the vital issues in the suit. As the legal right of the Corporation to carry out a proposed conversion of a portion of its preferred stock into bonds was dependent upon the amount of its assets there was a great inducement before the Corporation to overstate the value of its property in order to justify its capitalization. As shown later some of the Corporation's figures greatly exaggerated the true values.

The Bureau for the purposes of this third method of analysis has used the classification of property employed by the Corporation, shown in the preceding table. The basis of the Bureau's estimates by the different classes may now be briefly explained. For convenience in discussion the value of the ore property will be taken up last.

MANUFACTURING PROPERTIES.

For most of the subsidiary companies of the Steel Corporation the Bureau's valuations of the manufacturing plants were arrived at by deducting from the par value of the preferred stock issued at their respective organizations the amounts of working capital provided. The preferred stock, as already shown, in most cases represented the total assets acquired, which in several instances consisted exclusively of plants and working capital. Therefore the values of the plants could be arrived at by deducting the working capital from the amount of preferred stock. As the properties were acquired as going concerns, the preferred-stock issues probably included in some cases an allowance for intangible considerations, and this method may therefore somewhat overstate the value of the plants. This method was used in the case of the American Steel and Wire Company, the National Steel Company, the American Tin Plate Company, the American Steel Hoop Company, the National Tube Company, and the American Bridge Company. In the case of the National Steel Company, an addition of $2,561,000 was made on account of bonded indebtedness, which was considered as representing an equivalent investment in manufacturing properties. (Additional bonds were subsequently issued by this company, but almost entirely for other kinds of property.) A few of the other concerns had small amounts of indebtedness, bringing the total addition on this account up to $3,000,000. In the case of the American Sheet Steel Company, owing to evidence that even the preferred stock was heavily "watered," the value of the manufacturing plants was fixed at $12,000,000, although the preferred-stock issue was, roughly, $24,500,000. An addition of $1,000,000 was made to cover certain detached real estate. This company had $2,000,000 of bonded debt, but this has been considered as representing its natural-gas property. (See p. 26.)

The value given the plants of the Carnegie Company was the book value, as shown in the balance sheet of March 1, 1900. In the case of the Federal Steel Company, likewise, the value for its Illinois Steel Company plants was the book value at the time of their acquisition, while the value taken for its Lorain and Johnson companies' plants was practically the cash equivalent paid. The bond issues of these concerns, therefore, do not have to be considered.

The Shelby Steel Tube Company plants have been valued at $3,000,000.

The other constituent companies mentioned in the list on page 19 did not have any manufacturing plants.

The valuations thus arrived at are summarized in the following table:

BUREAU'S ESTIMATE OF INVESTMENT OF CONSTITUENT COMPANIES OF UNITED STATES STEEL CORPORATION IN MANUFACTURING PLANTS (INCLUDING BLAST FURNACES) AND REAL ESTATE AT THE DATES OF THEIR RESPECTIVE ORGANIZATIONS.

Company.	Preferred stock issued.	Current assets at organization.	Balance to represent plants.
American Steel and Wire Company	$40,000,000	$16,600,000	$23,400,000
National Steel Company [1]	27,000,000	9,000,000	18,000,000
American Tin Plate Company [1]	18,325,000	4,500,000	13,825,000
American Steel Hoop Company	14,000,000	3,000,000	11,000,000
National Tube Company	40,000,000	16,000,000	24,000,000
American Bridge Company [1]	31,374,000	11,500,000	19,874,000
Other companies:			
Carnegie Company (book value)			43,355,000
Federal Steel Company—			
Illinois Steel Company (book value)			20,200,000
Lorain and Johnson companies (approximate cash price)			4,000,000
Shelby Steel Tube Company (approximate cash price)			3,000,000
American Sheet Steel Company (estimated)			13,000,000
Add to cover investment in manufacturing plants represented by miscellaneous bonds			3,000,000
Total			196,654,000

[1] In the case of this company the preferred stock here given includes a small amount issued soon after the organization of the company.

This total of $196,654,000, it should be emphasized, is the indicated value of the manufacturing plants and accompanying real estate at the respective dates of organization of these constituent concerns (except in the cases of the American Bridge and Shelby Steel Tube companies), and not the value at the time of transfer to the Steel Corporation. As shown above, the aggregate surplus earnings of all the subsidiaries from the dates of their respective organizations to April 1, 1901, were approximately $117,700,000. A part of this was invested in manufacturing properties, and a portion of the original working capital of these concerns was also used for this same purpose. Just how much was invested in manufacturing plants is not definitely known. Large sums were invested in ore, coal, and transportation properties. On the other hand, there had very likely been some depreciation of these properties. From various data obtained the Bureau has concluded that an allowance of $250,000,000 would be sufficient to cover the total investment in these manufacturing properties on April 1, 1901. (Only a small addition had to be made on account of additional securities issued, because these were almost exclusively for other classes of property.)

That this allowance of $250,000,000 is sufficiently liberal is indicated by data furnished by the Steel Corporation. At the close of December, 1907, the Steel Corporation made an appraisal of its assets (see p. 44), in which the manufacturing properties (other than the Gary plant and those of the Tennessee Coal, Iron and Railroad Company) were valued at $367,600,000. This figure, according to the Corporation, represented the construction cost less accrued depreciation (see p. 41), except for real estate, which was taken at the current value. During the period from April 1, 1901, to December 31, 1907, there had been invested in net capital additions to these manufacturing properties (again excluding the Gary and Tennessee plants) approximately $114,500,000. Deducting this from the foregoing figure, gives an indicated investment in these manufacturing properties in April, 1901, of $253,000,000. This amount was over and above an expenditure of approximately $180,000,000 for ordinary maintenance and repairs which, in some cases, apparently included an allowance for depreciation although not so designated.

The Corporation's valuation of $367,600,000 at the end of 1907, however (and consequently the resulting figure of $253,000,000 for 1901), includes real estate at values in excess of those prevailing in 1901. Allowing for this fact, this 1907 appraisal of the Corporation does not indicate a valuation for the Corporation's plants in April, 1901, in excess of $250,000,000.

TRANSPORTATION PROPERTIES.

RAILROAD PROPERTIES.—The Bureau has placed the value of the railroad property of the Corporation at $70,000,000. This was almost exactly the book value—that is, the sum of the capital stock, bonds, and surplus. As shown in the detailed discussion in the body of the report, there can be little doubt that the Bureau's valuation is sufficiently liberal. This figure does not include an interest of, roughly, 48 per cent in the Pittsburg, Bessemer and Lake Erie Railroad Company not owned by the Corporation.

STEAMSHIP PROPERTIES.—The steamship property of the Corporation in 1901 has been valued by the Bureau at $20,000,000. This agrees almost exactly either with the cash prices paid by the Corporation, or with the net investment shown on the books of the constituent companies, either of which can not be regarded as understating the value. It is equivalent to an average of, roughly, $40 per ton of carrying capacity, including both barges and steamers. At the close of 1900 ore steamers of the most improved type could be constructed at an average cost of from $45 to $50 per ton of cargo capacity. The cost of barges was somewhat less. Since many of the vessels were more or less depreciated and somewhat obsolete in type, an average valuation of $40 per ton must be regarded as liberal. It is possibly excessive, but as any reduction which could reasonably be made would be comparatively small, it has been allowed.

DOCK PROPERTIES.—The only important dock property acquired by the Steel Corporation (other than certain docks included with railroads or manufacturing plants and embraced in the foregoing valuations for these) was that of the Pittsburg and Conneaut Dock Company, the book investment in which on April 1, 1901, was $1,236,375. An allowance of $1,500,000 for all miscellaneous dock property is undoubtedly sufficient.

On the foregoing basis, it will be seen, the total valuation for the transportation properties as a group is $91,500,000. It should be noted that this figure represents the entire value of these properties (except in the case of the Pittsburg, Bessemer and Lake Erie Railroad, as above noted), and not merely the equity value over and above bonded indebtedness.

COAL AND COKE PROPERTY.

The Steel Corporation's estimate of $100,000,000 for this property was undoubtedly excessive in some respects, particularly in the values assigned to coking-coal lands, a large portion of which was rated at $1,500 per acre. The Bureau has allowed $1,200 per acre for such coal, a figure which, in view of the facts set forth in the body of the report, must be regarded as entirely ample. This meant a reduction of $13,000,000; the steam coal estimate was reduced by $3,000,000. The Corporation's estimate, moreover, included additions made to the property since April 1, 1901, amounting to, roughly, $2,000,000. It also included an entry of $2,500,000 for certain property not acquired until the end of 1901. Allowing for these considerations, the Bureau has fixed upon $80,000,000 as an approximate but liberal valuation of this coke property in April, 1901.

NATURAL-GAS AND LIMESTONE PROPERTIES.

The Corporation, it will be seen, placed the value of the natural-gas property in 1901 at $20,000,000. Owing to the great difficulty of arriving at a conclusive estimate of the value of that property as it existed in 1901, the Bureau has allowed this valuation to stand. It may be pointed out, however, that this figure is about double the valuation of the Steel Corporation in 1907 for its natural-gas property at that date. The Corporation's natural-gas property was acquired chiefly through the Carnegie and American Sheet Steel companies.

The Corporation's allowance of $4,000,000 for the limestone property is undoubtedly excessive, but the amount is comparatively small and in the absence of satisfactory data the Bureau did not attempt to revise it.

WORKING ASSETS.

The working assets of $136,500,000 were arrived at from a consolidated balance sheet furnished by the Corporation. Purchase-money obligations and sundry real-estate mortgages were treated as bonded indebtedness. (See note 3 to the table on p. 36.) This total includes $25,003,000 cash capital provided for the Corporation at its organization.

SUMMARY FOR PROPERTY OTHER THAN ORE.

The Bureau's estimates of the tangible property of the Corporation, other than ore, in 1901, are therefore as follows:

Manufacturing, including blast furnaces	$250,000,000
Transportation	91,500,000
Coal and coke	80,000,000
Natural gas	20,000,000
Limestone	4,000,000
Working assets	136,500,000
Total	582,000,000

The total value assigned these classes of property in the Corporation's estimate of 1902 (see table on p. 21), it will be observed, was roughly $700,000,000, or, after including the bonded indebtedness of transportation properties and purchase-money obligations and mortgages, to make the two estimates fairly comparable, approximately $757,000,000. The Corporation's estimate, of course, included additions to property made from April 1, 1901, to July, 1902. Nevertheless the Corporation's estimate of its manufacturing properties was undoubtedly excessive. Except in this instance, the Bureau's valuations for these classes of property are not strikingly different from those of the Corporation in 1902.

VALUE OF THE ORE PROPERTY OF THE STEEL CORPORATION.

The ore valuation made by the Corporation, however, presents a very different question. The table on page 21 shows that the Corporation assigned a value of no less than $700,000,000 to its ore property, or almost one-half of the total claimed for all its assets. It is evident, therefore, that conclusions regarding the value of the ore must largely govern opinions as to the relationship between the capitalization and the actual property assets of the Steel Corporation as a whole.

The Bureau has estimated the value of this ore property by three different methods—first, on the basis of prices paid for ore in fee shortly before the Corporation was organized; second, on the basis of the price paid by the Steel Corporation itself for a certain portion of its ore property; and, third, by a calculation of the "present worth" of royalties on leased ore.

It should be explained that it is a very common practice for operators of iron mines to lease ore-bearing tracts on a system of rentals called "royalties"; that is, the lessee (or operator) contracts for the right to take ore from a given deposit and to pay the owner thereof a stipulated amount for every ton of ore taken out. Usually the lease provides that not less than a fixed minimum shall be paid for annually. Such a right to mine ore is called a "leasehold." A mine which is owned outright by the operator is spoken of as a "fee" mine, and the ore in such a mine or in a tract of land so owned is spoken of as "fee ore."

VALUATION BASED ON PRICES FOR FEE ORE.—In arriving at a valuation by this first method, which the Bureau regards as the least conclusive of the three, an effort has been made to determine in a rough way the prevailing prices for fee ore in 1901. Allowance must then be made for the fact that a considerable part of the Corporation's ore, instead of being owned in fee, was simply held by it under lease. The value of such leasehold rights necessarily is less than the value of a corresponding quantity of similar fee ore.

Fee prices of ore, owing to the great uncertainties which attend all mining enterprises, should be used only with great discretion. The price originally paid for a mining property may not, of course, represent the real market value of that property at a later period after development. For this reason prices paid for ore property in the early nineties have not been taken into consideration by the Bureau. The prices paid by the constituent concerns of the Steel Corporation in the late nineties, however, are entitled to some weight, although even these must be regarded as simply in the nature of evidence and not as conclusive. All available evidence indicates that prices of ore bought in fee in the late nineties seldom amounted to more than a few cents per ton on the estimated tonnage acquired.

As one instance it may be noted that the American Steel and Wire Company bought the Sauntry mine in 1899 for $700,000. This mine was estimated at the time to contain anywhere from 25,000,000 to 40,000,000 tons of ore. On the lower estimate of tonnage the price was less than 3 cents per ton and on the higher basis less than 2 cents per ton. A later estimate, based on expert examination, placed the tonnage at over 80,000,000 tons, which would indicate a price of less than 1 cent per ton. The reported prices paid for several other mines transferred in fee in 1899 and 1900 likewise averaged only a very few cents per ton on the estimated tonnage.

The following significant statement from a formal brief filed by the delegation from St. Louis County in the House of Representatives of Minnesota (the great bulk of the developed iron-ore deposits of Minnesota being in St. Louis County) as late as 1909 may be cited:

> The cheapest sales of fee ore we ever knew were for less than 1 cent per ton; the highest that we ever knew were for 15 cents per ton. There may have been sales at a higher price, *but we have never known of one, and upon inquiry can learn of none.*[1]

This emphatic statement, made eight years after the Steel Corporation was organized, during which period there had been a considerable advance in the value of ore property, together with much additional evidence presented in the body of the report, clearly indicates that fee ore in the ground in the Lake region in 1901 was on the average worth decidedly less than 15 cents per ton.

An estimate of 700,000,000 tons for the total ore holding of the Steel Corporation in 1901 must be regarded as liberal. Indeed the Corporation in its estimate of 1902, above given (see p. 21), reckoned on this tonnage, its valuation of $700,000,000, being at the rate of $1 per ton. It has since been admitted that this estimate made no allowance for the fact that a large part of the ore was simply leased and not owned in fee. The allowance of $1 per ton for even the fee ore was unquestionably extravagant.

Supposing that all the ore had been owned in fee in 1901 (which was not the case), and allowing as much as 10 cents per ton as a fair average value, the total value of a deposit of 700,000,000 tons would have been $70,000,000; at an average of 5 cents per ton only $35,000,000. Adding $9,000,000 to cover improvements to this mining property in 1901, this being approximately the book investment in these improvements (shafts, stripping, equipment, buildings, etc.), the indicated valuation of the entire property, based upon such fee prices, would range from $44,000,000 to $79,000,000. Even allowing as much as 15 cents per ton for the ore, which figure, however, is discredited by the statement of the mining interests above quoted, the total indicated valuation of the property, including improvements, would be only $114,000,000. However, these results are all on the assumption that all the ore was owned in fee, whereas at least one-half of it was simply leased. As stated above, such leases were worth less per ton than fee ore. If a correction were made for this, the above amounts would be substantially reduced.

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[1] Italics by Bureau.

PRICES PAID FOR ORE PROPERTY BY THE STEEL CORPORATION ITSELF.—The most important single block of ore property acquired by the Steel Corporation in 1901 was that of the Lake Superior Consolidated Iron Mines. An official statement at the time of the purchase placed the holdings of that concern anywhere from a minimum of 300,000,000 tons to well above 400,000,000 tons; the higher estimate later proved to be conservative. Using the lower figure, it will be seen that the holdings of this concern represented three-sevenths of the total accepted estimate of 700,000,000 tons. The quality of the ore properties of this company as a whole was certainly equal to the average quality of all the ore properties acquired by the Steel Corporation. The proportion of the fee ore apparently was higher than for the other ore property of the Corporation. By determining a valuation for so large a fraction of the total, therefore, it is possible to arrive at an approximate value of the entire holdings of the Corporation.

The Steel Corporation acquired the Lake Superior Consolidated concern on the basis of $135 of its own preferred and $135 of its common stock for each $100 of the old stock. The total par value of Steel Corporation securities thus issued was roughly $79,400,000. The market value, based on the average prices of Steel Corporation stocks for the first year of the company's operations ($94 for the preferred and $44 for the common), was approximately $55,000,000. While this was substantially the cash price obtained by the owners, it undoubtedly far exceeded any price which the purchasers would have been willing to pay in actual cash. Indeed, the market prices of the securities issued for this concern almost certainly overstate the real cash value of the property. Such prices in securities, even when reduced to the basis of actual market value, undoubtedly include what is in effect a price paid to get greater control of the ore situation.

In addition to its ore property, the Lake Superior Consolidated Iron Mines owned the entire $2,512,000 capital stock and $2,305,000 of the bonds of the Duluth, Missabe and Northern Railway. This railroad was exceptionally valuable. Its average earnings in 1900 and 1901 were at the rate of over 50 per cent yearly upon the capital stock. Its operating expenses in 1900 were less than 45 per cent of the gross earnings. (See p. 60.) Moreover, the capital securities of this road appear to have been fairly well protected by tangible assets alone. Without allowing anything for earning power, therefore, the investment value of these railroad securities at par, plus $3,000,000 to cover the surplus on April 1, 1901, was, approximately, $7,817,000.

Applying the rates of exchange into United States Steel stock—$135 for the preferred and $135 for the common for each $100 of the Lake Superior Consolidated stock—to this figure, gives a total of, roughly, $10,553,000 of each class of stock which may be considered as having been issued for this railroad property. Deducting this from the total amounts of Steel Corporation stock issued for the entire property of the Lake Superior concern (roughly $39,708,000 of each class) there would be left $29,155,000 of each class for the ore property. The market value of this stock at the average prices above given ($94 for the preferred and $44 for the common) would be $40,234,000.

Using the minimum estimate of 300,000,000 tons, this price was equivalent to 13.4 cents per ton for the ore; using the estimate of 400,000,000 tons the average would be almost exactly 10 cents per ton. These prices, it should be noted, include fee mines, leaseholds, and improvements, collectively, and not merely fee ore. The proportion of fee ore in the Consolidated company's holdings, as just stated, was apparently higher than for the other ore property acquired by the Steel Corporation taken as a whole. The property, moreover, included a large number of improved mines.

Applying these averages to the accepted estimate of 700,000,000 tons as the total ore tonnage of the Steel Corporation in 1901, the total cost of the acquisitions of ore property (with improvements), had it all been acquired on the same average basis per ton (assuming the same proportions for fee and leasehold mines) as this ore of the Lake Superior Consolidated Iron Mines, would have ranged from about $70,000,000 to $94,000,000, according to the tonnage assumed for the Lake Superior Consolidated Iron concern.

Calculations thus based upon this Consolidated Iron Mines purchase must be regarded as liberal and probably excessive. The rates of exchange allowed the Consolidated stock are in themselves indicative of an excessive payment. These rates figure out an approximate cash yield of $186 for each share of the Consolidated Iron Mines stock, whereas down to the close of 1899 the highest price for the stock for many years appears to have been $60 per share, and the highest price down to the close of 1900, $75 per share. It is incredible that there could have been any such rapid increase (nearly 250 per cent) in actual market value in this short interval. The chief owners of the Lake Superior Consolidated stock were Standard Oil capitalists who were under no pressure to sell, and who must have recognized the strategic position which the ownership of this ore and railroad property gave them, and who certainly must have intended to name what they considered a high price. The organizers of the Steel Corporation on their side were naturally willing to pay an extremely liberal price for this extensive property, particularly in view of the important degree of monopolistic control over ore transportation which was thereby secured. As will be shown in a later part of the report, the profits of these ore railroads have been exceptionally high. Altogether, therefore, the above totals of from $70,000,000 to $94,000,000, or, at any rate, the latter figure, must be regarded as a very liberal indication of the value of the entire ore property of the Steel Corporation. A special reason for this view, moreover, is that this purchase apparently included a relatively larger proportion of fee ore than obtained in the case of the remainder of the Corporation's ore. For example, the important holdings of the Carnegie interests were almost entirely leaseholds.

VALUE OF STEEL CORPORATION'S FEE ORE PROPERTY IN 1901 AS INDICATED BY "PRESENT WORTH" OF ROYALTIES ON LEASED ORE.—The third method employed by the Bureau for estimating the value of the ore property of the Steel Corporation in 1901 is based upon a computation of the "present worth" of royalties on leased ore. As already stated, a very common method of acquiring iron-ore property is by lease, the lessee mining the ore and paying a stipulated sum per ton ("royalty") as each year's production is mined and shipped. The royalty therefore measures, roughly speaking, the cost or worth of the ore in the ground for that portion which is immediately mined. However, it is obvious that the present worth of the royalties for the output of a distant year is less than the value of the royalty for the same amount of production in the current year, first, because the lessor (i. e., the owner of the ore) does not receive payment therefor until a distant year, such payment having a present value determined by the principles of discount, and, second, because he is meanwhile exposed to various risks attendant on the progress of mining the ore, which tends of course to enhance the rate of discount. Therefore the owner would be willing to sell his mine at a sum considerably less than the aggregate of the royalty payments which he might expect to realize if he leased it over a long period of years. Similarly, the lessee, if he were to purchase the mine in fee instead of making a lease, would expect to pay very much less than the aggregate of such royalties. The exact price which he would be willing to pay probably would not be computed by this method. But it is reasonably certain that on the average such cash prices for ore in fee would be less than the present worth of the aggregate royalty payments, discounted at a reasonable rate of interest. A particular reason is that a fee purchaser must bear the risk of ownership, such as the failure to find as much ore as expected, the discovery of more valuable deposits by competitive interests, or other contingencies which might adversely affect the value of the lease, particularly the possibility that the ore might not be extracted as rapidly as anticipated. A further reason is that the provisions of iron-mining leases are in many respects liberal to the lessee, thus making him the more indisposed to purchase in fee, unless the price is low.

Such calculations of the present worth of royalty payments therefore are of great service as affording another means for determining the value of this ore property of the Corporation.

In making such a computation of present worth it is necessary to determine upon four factors, as follows:

I. The tonnage of the deposit.
II. The average rate of royalty.
III. The rate of discount (or interest).
IV. The estimated duration of the deposit.

Tonnage of the deposit.—The tonnage of the deposit controlled by the Corporation in 1901 may be accepted, as in the preceding calculations, at 700,000,000 tons.

Rate of royalty.—The rate of royalty can be taken at 28 cents, as this was the actual average for 17,000,000 tons of Lake ore in 1902 (1901 data not being secured). This represented the great bulk of the royalty ore output of the Lake district in that year. It may be noted that in addition to the royalties there frequently were "bonus" payments; these are considered later. (See p. 34.)

In recent years there has been a rather decided increase in rates of royalty on new leases in the Lake region. (See p. 48.) However, this increase, much of which is undoubtedly due to the great concentration of ore properties in a few hands, should not be taken account of in this discussion of values in 1901.

Rate of discount.—As to the rate of interest for figuring discount, it is obvious that in a mining enterprise, which always involves a large element of risk, the prospective purchaser would be disposed to discount the value at a rather high rate. The Bureau, however, in order not to underestimate the value of the ore property, has based its conclusions in the main upon a discount rate of 6 per cent. This may be too low a rate in view of the risks involved, but the total difference in the indicated value of a deposit of not over 700,000,000 tons arrived at by the use of this rate as compared with a considerably higher rate is not of great importance in relation to the enormous total of the Steel Corporation's capitalization. In the body of the report, however, the values are computed at several different rates.

Duration of deposit.—An exhaustion period for an ore body of 700,000,000 tons can be estimated from the actual production from 1901 to 1910. The production of the Steel Corporation's mines for the entire year 1901 (including the operations of the subsidiary companies for the period from January 1 to March 31) was, roughly, 13,000,000 tons, and for the five-year period ended with 1905 it aggregated about 73,000,000 tons. In the next five years it increased to 103,000,000 tons, and a further increase would naturally be expected. In view, however, of the fact that the production of the first 10 years was only about 176,000,000 tons, or a little over one-fourth of the estimated total of 700,000,000 tons, it seems improbable that the remaining three-fourths will be exhausted within an additional period of 20 years; that is, within a 30-year period from the organization of the Corporation. Calculations are shown in the body of the report, however, based upon periods of 25 years, 30 years, and 35 years.

For all practical purposes, in dealing with an estimated deposit of 700,000,000 tons, the rate of production during the exhaustion period may be regarded as uniform. A rough calculation by a more scientific method involving the construction of a probable "curve of production" is, however, given in the body of the report.

It must be remembered that this 700,000,000 tons was simply the total ore holdings in 1901, the date now under discussion. This figure, of course, does not include very considerable additional holdings acquired by the Corporation since 1901.

Indicated valuations of fee ore.—Assuming an exhaustion period of 30 years and taking the royalty at the actual going average of 28 cents, and discounting this royalty at 6 per cent interest, the indicated worth of this ore body of 700,000,000 tons in 1901, *if bought in fee*, is, roughly, $95,300,000. The Bureau has given chief weight to these factors. Assuming an exhaustion period of 35 years and a uniform rate of production, the indicated value would be about $86,000,000. If a higher rate of discount were used, these valuations would be reduced.

It should be noted that rather wide differences in the original factors assumed produce only moderate discrepancies in the final results. Moreover, the results arrived at by the combination of any credible set of factors indicate a valuation only a small fraction of that claimed by the Steel Corporation in its estimate of 1902. As shown later, the valuations obtained by this method work out in surprising agreement with those obtained by the two methods already used.

The valuation of $95,300,000, it will be seen, is equivalent to almost exactly 13.6 cents per ton for fee ore. When it is recalled that a delegation of mining interests in the Minnesota Legislature as late as 1909 stated that, so far as they had been able to ascertain, 15 cents was the highest price ever paid for ore in fee, it would appear that the average valuation here given is high, even as an expression of the going value of fee ore. Only a portion of the Steel Corporation's ore was owned in fee. Possibly not one-third, or even one-fourth, of the total estimated tonnage of 700,000,000 tons was thus owned in 1901. In order to insure a sufficiently liberal valuation of the ore property, however, the Bureau has made its computations on the assumption that one-half of the total amount was owned in fee. At an average valuation of 13.6 cents per ton the total indicated value of this portion of the

Corporation's ore property would be approximately $47,600,000. While this figure is probably high, the Bureau has also allowed for the fact that bonus payments might be obtainable in the event of a transfer of these holdings under lease at an average royalty of 28 cents. This addition is stated below.

Transfer value of leases.—The value of the leases as distinct from that of the ore—that is, of the privilege of mining ore at stipulated royalties—may be considered as measured approximately by the bonus payments which such leases would command if transferred. Broadly speaking, the bonus is the amount paid for the purchase of a leasehold with its improvements. The actual average bonus payments on 23 leases made during the period 1900–1902, as reported to the Bureau by Dwight E. Woodbridge, a mining engineer of Duluth, were almost exactly 3 cents per ton. It is possible that this would be a sufficiently liberal allowance to apply to the entire 350,000,000 tons of the Steel Corporation's ore assumed to have been held under lease. It might, however, be argued that the leases of the Steel Corporation under the stipulated royalties, had they been on the market in 1901, would have commanded a rather higher average bonus. The Bureau, therefore, in order to fix upon a value which can not be challenged on the ground of undervaluation has allowed an average of 6 cents per ton, or double the average for the 23 mines above referred to. This average of 6 cents, applied to the assumed leasehold tonnage of 350,000,000 tons, gives a total of $21,000,000.

This covers the bonus value of the leased ore. It should be noted here that in using, for this calculation of fee-ore values, the average going royalty of 28 cents per ton, nothing has been allowed for the possibility that had all the *fee ore* of the Corporation been available for lease in 1901 it might also have commanded a bonus over that rate, which of course was largely governed by royalties on old leases. However, the royalties prevailing in 1901 do not appear to have been greatly in excess of those of earlier years. One reason for this may have been that the State of Minnesota was then leasing considerable tracts of State ore lands at a uniform royalty of 25 cents per ton. Still again, part of the fee ore owned by the Steel Corporation was of low grade, so that it is exceedingly doubtful whether it could have been leased at more than the current average rate of 28 cents per ton used in the preceding calculation. However, the Bureau has also made an addition of 6 cents per ton, or $21,000,000, to the value of the fee ore as above computed, this increase being equivalent to the average value of bonuses applied to leased ore. It is certain that this valuation for the fee ore is excessive. It gives the fee ore a value of 19.6 cents per ton, whereas the maximum price paid for such ore as late as 1909, according to competent authorities, was reported at 15 cents per ton.

INDICATED TOTAL VALUATION BY DISCOUNT METHOD.—The total indicated valuation of the entire deposit of 700,000,000 tons by this discount or "present-worth" method therefore amounts to $89,600,000, as follows:

1. $47,600,000, for the value of the fee ore based upon the average going royalty in 1901, without any allowance for bonus.

2. $21,000,000, to cover the possible bonus value of such fee ore over and above the preceding valuation, had it been available for lease in that year.

3. $21,000,000, for the transfer or bonus value of the leaseholds themselves.

It is probable that this valuation of $89,600,000 is sufficiently liberal. While no specific amount has been allotted in this estimate for improvements to mining property, the bonus additions, aggregating for the fee and leased ore together no less than $42,000,000, undoubtedly include a very substantial amount for such improvements. The actual book value of the improvements to the Steel Corporation's mining property in 1901, it will be recalled, was about $9,000,000. To add this sum to the preceding total of $89,600,000, would undoubtedly result in duplication. However, it is possible that the bonus calculations may not be sufficient to cover all of the improvements to mining property. The Bureau has allowed for this in its final estimate.

SUMMARY OF ORE VALUATIONS.—Comparing the Bureau's estimates of this ore property by the several methods described, it will be seen, first, that the current prices of fee ore indicate that the fee properties and leaseholds of the United States Steel Corporation were worth much less than $90,000,000; second, that the terms of the purchase of the Lake Superior Consolidated Iron Mines indicate a total value for all the ore property of the United States Steel Corporation in 1901 of not over $70,000,000 to $94,000,000; and, third, that the valuation based on present worth of royalties and bonus values of leases indicates that the same property was worth about $90,000,000.

Altogether there can be no doubt that an estimate of from $90,000,000 to $95,000,000 as the value of this ore property would be sufficiently high. Taking all the facts into consideration, however, the Bureau concluded to allow a round value of $100,000,000 for the ore property in 1901.

It is worth calling passing attention to the fact that in the year 1902 the total valuations, as assessed for taxation, of all iron-mining properties in the States of Minnesota and Michigan, of which at that time the United States Steel Corporation probably owned not much over one-half, was only about $54,000,000. Practically all the Corporation's ore holdings were then in these two States. In other words, the Corporation's ore property, which, for taxation, was probably assessed at considerably less than $40,000,000, was, for the purpose of justifying its capitalization, valued at $700,000,000. Of course, it is not intended to say that the tax valuations represented the full value of the property.

SUMMARY OF BUREAU'S VALUATIONS BY DEPARTMENTS OF THE BUSINESS.

The valuations for the different classes of the property of the Corporation in 1901, arrived at by the Bureau by this third method, are in the following table summarized and compared with those of the Corporation in 1902, as already given on page 21.

VALUE OF TANGIBLE ASSETS ACQUIRED BY STEEL CORPORATION IN 1901, AS COMPUTED BY BUREAU, COMPARED WITH ESTIMATE OF CORPORATION SUBMITTED IN THE HODGE SUIT IN JULY, 1902.

Class of property.	Bureau's estimate of tangible values in 1901.	Corporation's estimate of tangible values in 1902.	Difference.[1]
Ore property	$100,000,000	$700,000,000	$600,000,000
Manufacturing plants, including blast furnaces	250,000,000	348,000,000	98,000,000
Railroad, steamship, and dock property	91,500,000	[2] 120,340,000	28,840,000
Coal and coke property	80,000,000	100,000,000	20,000,000
Natural-gas property	20,000,000	20,000,000	....
Limestone properties	4,000,000	4,000,000	....
Cash and cash assets	136,500,000	[3] 164,660,000	28,160,000
Total	682,000,000	1,457,000,000	775,000,000

[1] A part of the differences between the two estimates is accounted for through additions made to property during the interval from April 1, 1901, to July 1, 1902, such additions, of course, being included in the Corporation's figures.

[2] This figure includes $40,340,000 of indebtedness which was not included in the estimate of the Corporation, this addition being made in order to render the estimates comparable.

[3] In arriving at this figure purchase-money obligations and real-estate mortgages of $16,369,000, which were deducted by the Corporation (see table on p. 21), were restored by the Bureau to make the amounts comparable.

The total valuation of $682,000,000, it will be seen, is less than one-half the value claimed by the Corporation in 1902. Nevertheless, in every case the valuations of the Bureau are believed to be liberal. As already noted, the estimates of the Corporation include additions to the property up to July 1, 1902. Such additions, however, would explain only an insignificant part of the discrepancy, and, in the case of the ore, are entirely negligible.

It may be repeated that the Bureau's figures do not allow for any additional value which may have been imparted to these properties by the mere act of consolidation. A large part of any such addition is properly excluded from consideration, as it must have been due in a measure to concentration of ownership and control or the restriction of competition. While the merger of such properties, particularly on account of greater integration, might have imparted a considerable value to them as going concerns over and above the aggregate of the valuations prior to consolidation, it is impossible to separate any such increase in value, due to coordination and integration, from the increase due to the elimination of competition, and therefore no quantitative statement of such additional value has been attempted by the Bureau.

COMPARISON OF VALUATIONS OF STEEL CORPORATION'S PROPERTY IN 1901 WITH ITS CAPITALIZATION.

The Bureau's valuations of the Steel Corporation's property in 1901, arrived at by these different methods, may now be compared with its outstanding capitalization at that time. This is done in the following table:

COMPARISON OF ESTIMATES OF VALUE OF PROPERTY OF UNITED STATES STEEL CORPORATION AT ITS ORGANIZATION IN 1901, WITH PAR VALUE OF ITS SECURITIES.

		Excess of securities over estimates.
Total capitalization in April, 1901, including underlying bonds and purchase-money obligations	[1] $1,402,846,817	
Investment in tangible property alone, indicated by historical analysis	676,000,000	$726,846,817
Value of all property, tangible and intangible, as indicated by market prices of securities of constituent concerns	793,000,000	609,846,817
Value of tangible property as estimated by departments of the business	682,000,000	720,846,817

[1] Excluding $535,407 unacquired stock in constituent concerns for which no corresponding deduction was made in the first and third estimates.

It will be seen at once that the securities issued by the Steel Corporation very greatly exceeded the indicated value of the property acquired, as established by any one of the three methods of valuation. The valuation of the tangible property arrived at by historical study, as well as that by departments of the business, shows an excess of capitalization greater than the indicated value itself. The valuation by departments, namely, $682,000,000, shows an excess of nearly $721,000,000. Even taking the indicated market value of the securities of the subsidiary concerns, namely, $793,000,000, which valuation includes the public estimate for intangible considerations as well as physical property, the excess of the Steel Corporation's capitalization was still over $609,000,000. Naturally the valuation arrived at by this method exceeded those obtained in the other two cases.

The Bureau does not contend that the capitalization of the Steel Corporation should have been fixed at any one of the three valuations here presented. All that is attempted at the moment is to present a comparison of these valuations with the capitalization. The figures show clearly that the entire issue of approximately $508,000,000 of common stock of the Steel Corporation in 1901 had no physical property back of it, and also a considerable fraction, say from one-fifth to two-fifths, of the preferred stock was likewise unprotected by physical property. Even granting that there may have been a considerable value in intangible considerations, it is reasonably clear that at least the entire issue of common stock, except in so far as what may be termed "merger value" may be considered, represented nothing but "water."

While, therefore, it is not the purpose of this report to say what should have been the capitalization of the Steel Corporation, it is obvious that the company was heavily overcapitalized, judged by any reasonable standard.

OVERCAPITALIZATION INDICATED BY ENORMOUS COMMISSION TO UNDERWRITING SYNDICATE.

Very convincing evidence of a ruling tendency toward excessive capitalization is afforded by the enormous payment the Steel Corporation allowed its underwriting syndicate. This syndicate, as shown elsewhere, provided the Corporation with $25,000,000 of cash capital and also incurred expenses of about $3,000,000 either in buying scattered parcels of stock or otherwise, making its total cash expenditure $28,000,000. For this cash consideration, plus its underwriting services, the syndicate received from the Steel Corporation the enormous total of practically 1,300,000 shares of its stock (half preferred and half common) of an aggregate par value of practically $130,000,000. This stock appears to have realized approximately $90,500,000 (counting $4,000,000 unsold preferred stock at par), leaving as profit to the syndicate, over and above the $28,000,000 cash expenditure noted, a net sum of about $62,500,000. Of this, one-fifth, or $12,500,000, went to the syndicate managers for their services as such, the remaining $50,000,000 being distributed to the syndicate members.

There can be no question that this huge compensation to the syndicate was greatly in excess of a reasonable payment. For the $28,000,000 cash consideration the syndicate was properly to be reimbursed, and furthermore was entitled to additional compensation for raising that amount. Moreover, the syndicate was entitled to some compensation for its other services. Clearly, however, these services can not be considered as worth the huge sum actually allowed. The syndicate was under no obligation whatever to see the organization of the Steel Corporation through, but, on the contrary, the syndicate managers expressly reserved the right at any time in their own discretion wholly to abandon the transaction. The risk of the syndicate over and above the $28,000,000 cash consideration, therefore, can not be considered great. It is true that the nominal liability of the syndicate was $200,000,000, but it was generally understood at the time that only $25,000,000 in cash would be called from syndicate members, and this was the full amount actually called. Moreover, the syndicate was obligated to provide only $25,000,000 cash capital (aside from certain expenses) to the Steel Corporation, and the fact that the nominal liability of the syndicate was $200,000,000 could not increase this cash obligation to the Corporation, but was simply an arrangement between the syndicate managers and the syndicate members.

It should be pointed out that the syndicate managers were prominently identified with the management of several of the companies acquired by the Steel Corporation, and also with the management of the Corporation itself. Three partners of the firm of J. P. Morgan & Co., the syndicate managers, were on the directorate of the Corporation, and one of them was also chairman of the finance committee. Moreover, the underwriting syndicate included the heads of several constituent companies. These facts are entitled to great weight in connection with this enormous commission allowed to the syndicate. In other words, as managers of the Steel Corporation these various interests virtually determined their compensation as underwriters.

This extravagant compensation to the underwriting syndicate may fairly be cited as further evidence of a general disposition toward excessive issue of securities.

This huge commission, it should be noted, followed very liberal commissions allowed at earlier dates to the promoters of several of the various constituent companies. Assuming that of the total of, roughly, $65,000,000 par value each of preferred and common stock allowed the Steel Corporation underwriting syndicate, $28,000,000 of each class (a common basis of compensation in such cases) was for the cash consideration noted, there would be left as a commission alone $37,000,000 par value of each class, or a total of $74,000,000 par value. Adding to this the amounts allowed for similar commissions in the case of constituent companies at the dates of their respective organizations, and taking into account that the stock so issued by constituent companies received the same terms of exchange from the Steel Corporation as other stock of the same class, it would appear that of the Steel Corporation's stock in 1901 at least $150,000,000 (this including over $40,000,000 of the preferred) was issued either directly or indirectly for such promotion or underwriting services, this being over and above the enormous amounts of common stock issued as a bonus for property and for cash.

ADDITIONS TO PROPERTY OF THE STEEL CORPORATION SINCE 1901.

Since 1901 the Steel Corporation has greatly increased its investment. This increase has come about in two ways—first, and most important, through new construction and additions by the investment of surplus earnings and new capital derived from the sale of securities; and, second, through the acquisition of competing concerns through issue of securities directly therefor.

The capital additions to fixed property, by classes, are stated annually in the published reports of the Corporation, except for those made through the acquisition of the Union Steel Company in 1902, the Clairton Steel Company in 1904, and the Tennessee Coal, Iron and Railroad Company in 1907. All three of these properties were acquired substantially through the issue or assumption of bonds, and the actual investment of the Steel Corporation therein has been taken as the par value of such bonds (with the exception of a small amount of such bonds purchased by the Steel Corporation in the open market at less than par, and used in part payment for the Clairton and Tennessee concerns). This investment may differ from a fair value of these acquisitions, but for the present purpose this need not be considered.

By combining the net additions to fixed property made through direct expenditure and through such acquisitions, with the increase in the current assets, and adding these amounts to the original value in 1901, as computed by the Bureau (which has been considered as the Corporation's investment at that time), the total investment of the Corporation at the close of 1910 may be determined. Such total investment, it is true, may not represent the actual value of the tangible property of the Steel Corporation on that date, particularly on account of appreciation in the value of natural resources, including real estate. The rise in value of property of the Corporation between 1901 and the close of 1910, however, would necessarily have to take account of the great concentration of control of the industry enjoyed by the Steel Corporation, particularly with respect to the ownership of ore. This is a factor that can not be measured here. Therefore, the Corporation's *investment* in its properties, rather than the *valuation* of these properties, is the proper basis for the current discussion, as well as for computing profits taken up later.

The following table shows the additions to the investment of the Steel Corporation from 1901 to 1910, together with certain deductions for depreciation which were considered by the Bureau as proper:

NET ADDITIONS TO INVESTMENT OF STEEL CORPORATION, APRIL 1, 1901, TO DECEMBER 31, 1910.

Description.	Total additions.	Estimated true depreciation.	Amount made good by expenditures not capitalized.	Net outstanding depreciation to be deducted from investment.	Net additions to investment.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):					
Manufacturing	$151,480,449	$107,060,053	$88,918,509	$18,141,544	$133,338,905
Iron ore	62,093,931	30,293,497	2,345,016	27,948,481	34,145,450
Coal and coke	34,112,303	21,220,986	5,534,665	15,686,321	18,425,982
Transportation	74,541,029	37,336,955	13,462,331	23,874,624	50,666,405
Miscellaneous fixed property	5,548,556	4,242,626	1,435,082	2,807,544	2,741,012
Other assets:					
Deferred charges	13,243,678				13,243,678
Investments	2,128,364				2,128,364
Sinking funds	16,067,666				16,067,666
Current assets	101,683,544				101,683,544
Total	460,899,520	200,154,117	111,695,603	88,458,514	372,441,006
Gary plant[1]	69,978,695				69,978,695
Tennessee Coal, Iron and R.R. Co.[2]	60,468,518	2,856,003	1,832,843	1,023,160	59,445,358
Add property adjustments	3,063,594				3,063,594
Grand total	594,410,327	[3] 203,010,120	113,528,446	[3] 89,481,674	504,928,653

[1] Includes city of Gary and railroad property. The figure is the construction cost. Depreciation of this plant is included in the figures given above. (See note 1, Table 38, p. 310.)

[2] Original cost of fixed property plus subsequent additions.

[3] Excluding an item of $385,181 which could not be distributed.

The figures of true depreciation given in this table represent the entire estimated depreciation in the properties of the Corporation, including exhaustion and obsolescence. The bulk of such physical depreciation was made good by expenditures on these properties which were not capitalized, thus leaving a balance which may be termed a "net accrued" or "outstanding" physical depreciation not made good, which balance has been set against the additions in order to arrive at the net additions to the investment.

In the case of the manufacturing properties the total allowance for estimated true depreciation is equivalent to rather less than 4 per cent yearly on the average investment in these (excluding land). This might at first sight seem too small. However, there was also expended during this period no less than $180,000,000 (1901 figures estimated) in so-called ordinary maintenance and repairs, which items apparently go far toward maintaining these properties in a high state of efficiency. The sum of these provisions for repairs, maintenance, and depreciation is equivalent to about 10 per cent yearly upon the average investment in these properties, again excluding land. These provisions taken together appear to be sufficient.[1]

The allowance for depreciation of ore property, $30,293,497, is equivalent to about 17 cents per ton on the actual production. A part

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ent, see pages 304-306.

of this represents depreciation of improvements, and a small part is for exhaustion of timber on ore lands. The greater part of this allowance, however, is for exhaustion of the ore. It seems rather high, especially in view of the fact that the bulk of the production was from leaseholds and not from fee mines, but the Bureau has allowed it to stand for the purposes of the present discussion because of the great difficulty involved in making a satisfactory division, and the relatively small importance which any changes so made would have in the final computation of either investment or of profits.

The total of $21,220,986 for depreciation of coal and coke property allows about 10 cents per ton as exhaustion proper of high-grade coking coal distinct from exhaustion of other coal and depreciation of coke-oven property and mine improvements.

The depreciation allowed for the transportation property, chiefly on railroads, seems high in view of the liberal expenditures for ordinary maintenance, but the Bureau has accepted it. The amount as given includes an allowance of, roughly, $6,700,000 for obsolescence, as distinct from actual depreciation, made on the theory that when the ore along the line of these railroads is exhausted the railroad property itself will lose the great bulk of its value. The provisions in the case of the steamship, dock, and miscellaneous properties appear reasonable.

In all cases the expenditures for ordinary maintenance and repairs have been large. Such expenditures for all classes of property for the period from 1902 to 1910 aggregated $245,271,000 (1901 figures never having been compiled).

Having determined upon an estimate of the true total depreciation for the purpose of computing the investment, the Bureau has, therefore, in the table on page 41, deducted from the investment those portions of the depreciation or the net accrued depreciation which had not actually been made good by expenditures upon the respective properties.

While, therefore, the total allowances for depreciation for certain classes of property appear somewhat excessive, the Bureau, after analysis, has for the purpose of computing the investment accepted these estimates as the actual depreciation of the Corporation's physical properties. They differ somewhat from the provisional allowances as stated in the annual reports. These provisional allowances in a few cases were admittedly excessive or included amounts not representing actual depreciation. Such excessive provisions have been excluded by the Bureau and also restored to the earnings (see p. 53). The total depreciation allowances given in the table include provisions for blast-furnace relining, which in the annual reports are not included under the provisional depreciation allowances.

The constituent companies of the Corporation very properly compute their depreciation charges (including exhaustion) on the original cost of, or investment in, the various properties and not on the replacement cost (either actually incurred or anticipated).

In addition to the provisions for depreciation above described, the Steel Corporation writes off its property account each year other varying sums, usually of large amount. These further sums, however, as explained by the Corporation to the Bureau, do not represent true depreciation based on original cost or purchase value of the physical property to subsidiary concerns, but are instead an offset of a part of the inflated valuations at which the stocks of the subsidiary companies are carried on the books of the Steel Corporation. Such additional amounts written off by the Steel Corporation itself, on account of over capitalization, while probably entirely justified from that standpoint, have, however, no relation to the real depreciation of such first cost of the physical properties, and consequently have not been deducted from earnings by the Bureau.

The treatment of these various depreciation charges is fully explained in the body of the report.

INDICATED INVESTMENT IN THE PROPERTY OF THE STEEL CORPORATION AT THE CLOSE OF 1907 COMPARED WITH APPRAISAL MADE BY CORPORATION AT THAT DATE.

By combining the net additions to the property of the Corporation from 1901 to 1910, as stated in the preceding table, with its investment in 1901 the investment at the close of 1910 is obtained. Before doing this, however, it is desirable to make an intermediate comparison of the total investment at the close of 1907 with an appraisal of the various properties of the constituent concerns which was made at that date by the Corporation itself.

This appraisal of the Steel Corporation at the close of 1907 is in the following table compared with the indicated *investment* in the property at that date, as computed by the Bureau by adding to the values determined upon by the Bureau for April, 1901 (see table on p. 36), the net additions down to the close of 1907, computed in the manner already indicated in the table on page 41.

BUREAU'S ESTIMATE OF INVESTMENT IN PROPERTY OF STEEL CORPORATION AT CLOSE OF 1907 COMPARED WITH CORPORATION'S ESTIMATE OF VALUE AT THAT TIME.

Description.	Investment as computed by Bureau.	Value as estimated by Corporation.	Difference.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):			
Manufacturing	$364,441,140	$367,632,230	$3,191,090
Iron ore and timber	119,879,749	[1]641,242,880	521,363,131
Coal and coke	95,557,205	142,521,913	46,964,708
Transportation	127,013,555	145,048,041	18,034,486
Miscellaneous fixed property	26,236,798	19,619,052	[2] *6,617.746*
Other assets:			
Deferred charges	6,204,734		[3] *6,204,734*
Investments	1,717,120		[3] *1,717,120*
Sinking funds	32,442,402	32,442.402	
Current assets	229,347,483	229,347,483	
Total	1,002,840,186	1,577.854,001	575,013,815
Gary plant [4]	24,063,388	24,063,388	
Tennessee Coal, Iron and Railroad Company	49,842,295	49,747,753	[5] *94,542*
Sundry adjustments	2,017.733		[3] *2,017,733*
Grand total	1,078,763,602	1,651,665,142	572.901,540

[1] Includes about $5,700,000 of timber property.

[2] This excess of the Bureau's figure over that of the Corporation is chiefly due to the fact that in computing the investment in 1901 the Bureau allowed a very liberal valuation. The Corporation contends that its 1907 appraisal of these properties was very conservative.

[3] Excess over Corporation's estimate, which did not include these items specifically, but which, however, allows for most of them in other items.

[4] Includes city of Gary and railroad property.

[5] Excess over Corporation's estimate.

The Corporation's valuation of the manufacturing properties was made in great detail and it is claimed that, apart from the real estate of these plants, which was separately itemized, the figures were for the construction cost. They agree substantially with those of the Bureau.

The Corporation's appraisal value of the transportation properties considerably exceeds the investment figure of the Bureau.

The excess of the Corporation's figure for coal and coke over that of the Bureau is chiefly due to the fact that it represents a current valuation, whereas the Bureau's figure is the valuation in 1901 plus the actual cost of subsequent investment, without allowing for any appreciation during this interval. Undoubtedly there had been some appreciation in the coal property during the period 1901–1907. This must be attributed in part to the fact that the great bulk of the Connellsville coking coal lands was owned by the Steel Corporation.

The figure used for the Gary plant is the Corporation's figure of construction cost.

The fixed property of the Tennessee Coal, Iron and Railroad Company has been entered by the Bureau at its cost in bonds issued by the Steel Corporation and underlying bonds assumed (subsequent additions also being included). The price paid for the stock as measured by the market value of the bonds so issued was equivalent to about the par value of the Tennessee company's stock, or roughly, $30,000,000 over and above bonded debt. The value of the property represented by this stock is difficult to estimate. For two years prior to the sale the average price of the stock on the New York Stock Exchange was about $146 per share. The stock, however, was a notoriously speculative security so that the market quotations are an uncertain guide. A consolidated balance sheet of the company of October 31, 1907, or just before the transfer of the company to the United States Steel Corporation, showed a surplus of $1,199,823, thus making the book value of the stock about $104. The fixed property in this balance sheet was carried at $44,988,699, which amount was at once written down by the Steel Corporation to $44,037,140, this placing the plants at $15,382,234, the mineral lands and certain real estate at $26,525,144 (except for an interest in the Potter Ore Company carried at $398,000), the balance representing miscellaneous real estate and railroad property. There is reason to believe that the plants were considerably overvalued. The book valuation of its mineral properties appears to have been liberal. Although these were enormous in extent, the market value was very low as compared with northern coal or Lake Superior ore, first on account of the low grade and second because of the great abundance of such raw materials in that region as compared with the market demand therefor.

Altogether it is doubtful whether the tangible property (including working assets) after allowing for bonds exceeded the par of the stock. However, the property probably had a potential value in excess of these assets, which value presumably was taken account of by the Steel Corporation. While the removal of competition may have influenced the price, still, taking all the property into consideration, the Bureau has deemed it reasonable to enter it at the actual cost.

Therefore, as in the case of the Corporation's estimate of 1902, the principal difference between its figures and those of the Bureau in this comparison for 1907 occurs in the item of iron ore. Here the valuation claimed by the Corporation is, roughly, $641,000,000, whereas the indicated investment in this property, as determined by the Bureau, is only $120,000,000. As repeatedly pointed out, the Bureau's figure of investment in this ore property is not an expression of the actual value of that property at the close of 1907. The Bureau has not attempted a valuation of the ore property at that time. A very large proportion of the available ore of the Lake Superior region had passed into the hands of a very few concerns, and especially into the hands of the Steel Corporation itself. Unquestionably this great concentration of ownership and control had much to do with whatever appreciation in ore values may have taken place since 1901. Even if a fair market value of the ore property in 1907 were established, it would so largely reflect the influence of this concentration of ownership as to be unsatisfactory for the purpose of this discussion. It would be practically impossible to measure and thus to segregate the appreciation in ore valuations which has come about solely from the concentration of ownership, from that which might have occurred under more competitive conditions. Therefore, instead of attempting to value this ore property, the Bureau has simply presented a statement of the aggregate actual investment.

While, however, the Bureau has not attempted to make a definite valuation of the ore property of the Steel Corporation at the close of 1907, it should be pointed out that the value of $641,000,000 claimed by the Steel Corporation is greatly excessive. Of this, roughly, $607,000,000 was for ore (fee properties and leaseholds)—as distinct from improvements—covering a tonnage of approximately 1,182,000,000 tons, or an average of 51 cents per ton. Convincing evidence that this valuation is excessive is shown by the actual cost of additions to the ore property since 1901. The total capital expenditures upon ore property by the Corporation from April 1, 1901, to the close of 1907 before deducting depreciation were $38,600,000. Of this total, approximately $19,000,000 represents the amount expended for ore, including fee and leasehold properties collectively. The total additions to the ore reserves of the Corporation by this expenditure (again taking leaseholds and fee properties collectively) were certainly several hundred million tons; this not including the "Hill" ore, which the Steel Corporation itself did not include as an asset in its appraisal (except for certain expenditures for development work and advanced royalties). The exact amount added can not be stated because large additions to the estimated total have been made by proving up ore land owned in 1901.

It is worth noting, incidentally, that this valuation of, roughly, 51 cents per ton at the close of 1907 compares with a valuation in the Hodge suit in 1902 of $1 per ton. Since there had been some appreciation in ore values during this interval, the 1902 estimate, it will be seen, is very thoroughly discredited by the Corporation's own figures of 1907.

Therefore the average cost per ton of the ore acquired since 1901, again taking fee and leaseholds collectively, was only a few cents, whereas, as just shown, the total value claimed by the Steel Corporation indicated an average of over 50 cents a ton. While the original cost of a mining property is not a reliable indication of its value subsequently, it is impossible to accept an average valuation of as much as 50 cents per ton for the ore of the Steel Corporation, in view of the low actual cost of the enormous quantity acquired during this period. There is no satisfactory explanation why ore, which, for purposes of purchase from outside concerns, is worth only a few cents per ton suddenly becomes worth 50 cents by the mere act of transfer to the United States Steel Corporation. Therefore the inevitable conclusion is that the Steel Corporation's appraisal of 1907, just as its estimate in the Hodge suit in 1902, placed an extravagant valuation upon its ore property.

It should be pointed out that the bulk of the Steel Corporation's ore property in 1907 consisted of leaseholds and not ore in fee. For the mining of ore from such leaseholds, the Corporation must, of course, pay a royalty. In other words, for the greater part of its ore property the Steel Corporation merely had an equity interest in the ore. It is inconceivable that this equity, together with the value of the ore owned in fee, could have been anything like the total valuation claimed by the Steel Corporation in its foregoing appraisal, although this equity in old leases had increased somewhat during this period, owing to some advance in the average rates of royalty on new leases.

GREAT NORTHERN ORE LEASE.—As noted above the Corporation in its valuation of its property in 1907, did not enter anything for the value of the Great Northern or "Hill" ore lease. This lease, on account of the royalties provided therein, has often been referred to as an indication of the increased value of Lake ore.

The Great Northern Railway interests, which had acquired control of immense tonnages of ore by purchase or lease for the protection of the traffic of their railroad, transferred the larger part of these holdings by lease to the Steel Corporation at the beginning of 1907. Under this lease the Steel Corporation agreed to mine the ore and ship it over the Great Northern Railway and, substantially, to pay, for the year 1907, a royalty at the rate of 85 cents per ton on dried ore containing 59 per cent iron. In each successive year the royalty was to be increased by 3.4 cents per ton. For ores richer or leaner in iron a sliding scale of royalties was provided which was also subject to the same yearly additions of 3.4 cents. Very high minimum tonnages were also agreed upon, increasing from 750,000 tons in 1907 to 8,250,000 tons in 1917, after which a fixed minimum of 8,250,000 tons was stipulated. It was provided that the Steel Corporation might cancel the lease January 1, 1915, on giving 2 years' notice.

While the average royalty which will actually be payable under this lease will depend on the quality of the ore shipped, the indications from the royalties paid on shipments up to 1910, inclusive, are that the average iron content has not fallen very much below the 59 per cent grade of ore.

A royalty of 85 cents with annual increases of 3.4 cents is absolutely unprecedented in the Lake ore trade. It is true that one or two leases have been made for small and exceptionally valuable ore deposits with fixed royalties of $1 per ton. The royalties, however, on all new leases, other than the Hill lease, which the Steel Corporation has made from the beginning of 1907 to the present time apparently will not average over 40 cents per ton. Moreover, there is no indication that either the average quality of the ore on the Hill lease or the costs of mining it justify the payment of exceptionally high royalties. The royalties stipulated in the Hill lease, therefore, were and are still far above the market value.

The only reasonable explanation of this extraordinary transaction is that the Steel Corporation desired to prevent this ore either from being mined and sold to independent producers, thus possibly depressing the price of ore, or from being utilized by the Hill interests to build up a new and dangerous competitor in the iron and steel business, thus depressing the market prices of iron and steel products. The Steel Corporation was the only concern in the iron and steel business which was strong enough financially and which had a sufficiently large productive capacity even to consider the taking over of such a large quantity of ore at such a high royalty.

The Steel Corporation expressly disclaims any intention to head off competition by this lease, and asserts that it merely desired to strengthen its ore reserves. Whatever the motive for this transaction, its practical effect was to forestall competition as well as to increase the Corporation's control of the ore resources of the country. As the rate of royalty agreed on was greatly in excess of current market rates on ordinary transactions, it is not surprising that the Corporation made no claim to an increase of its assets on account of this lease.

The high royalty named in this lease, therefore, instead of being indicative of a marked enhancement in ore values, is rather evidence of the extent to which the Steel Corporation was willing to go in order to prevent this ore from falling into the hands of rival interests.

INVESTMENT OF STEEL CORPORATION AT THE CLOSE OF 1910.

The Steel Corporation has made no detailed appraisal of its properties since the close of 1907. The Bureau's computation of the investment in the Corporation's property down to the close of 1910 is given in the following table:

INVESTMENT IN TANGIBLE PROPERTY OF STEEL CORPORATION ON DECEMBER 31, 1910, AS COMPUTED BY BUREAU.

Description.	Investment 1901.	Net additions 1901–1910.[1]	Total investment Dec. 31, 1910.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):			
Manufacturing	$250,000,000	$133,338,905	$383,338,905
Iron ore	100,000,000	34,145,450	134,145,450
Coal and coke	80,000,000	18,425,982	98,425,982
Transportation	91,500,000	50,666,405	142,166,405
Miscellaneous fixed property	24,000,000	2,741,012	26,741,012
Other assets:			
Deferred charges	2,088,027	13,243,678	15,331,705
Investments	241,030	2,128,364	2,369,394
Sinking funds	239	16,067,666	16,067,905
Current assets	134,224,089	101,683,544	235,907,633
Total	682,053,385	372,441,006	1,054,494,391
Gary plant [2]		69,978,695	69,978,695
Tennessee Coal, Iron and Railroad Company		[3] 59,445,358	59,445,358
Adjustments [4]		3,063,594	3,063,594
Grand total	682,053,385	504,928,653	1,186,982,038

[1] As per table on page 41.

[2] Includes city of Gary and railroad property.

[3] Original cost of fixed property and additions thereto since its acquisition.

[4] Sundry adjustments made in the balance sheet without distribution by classes of property.

The Bureau has therefore computed the actual investment of the Steel Corporation in its various properties at the close of 1910 at $1,186,982,038. This compares with a total valuation in April, 1901, of $682,053,385. In other words, during the period from April, 1901, to December 31, 1910, the Corporation has made an additional net investment in its properties of no less than $504,928,653. Of this amount, roughly, $435,000,000 was virtually provided from earnings These amounts, it should be noted, are over and above the allowance for ordinary maintenance and repairs and for actual net depreciation as given above (p. 41).

This great addition to the investment of the Steel Corporation has eliminated a considerable amount of the "water" in the original capitalization of the company. The increase in the investment does not, however, exactly measure the amount of water or inflated capitalization thus offset, partly because the capitalization of the Corporation has not been the same. In the first place, the capitalization has been considerably increased, particularly through the issue of new bonds and other forms of indebtedness and also through the assumption of liabilities of several concerns which have been acquired. On the other hand, a part of this increase has been offset by the liquidation of a part of the bonded indebtedness. Although the preferred stock of the Corporation was reduced in 1903 by $150,000,000, this was accomplished only by a corresponding increase in the bonded debt, by the so-called bond conversion plan, a severely criticized operation and one involving certain objectionable features, fully discussed in the body of the report. The total net outstanding capitalization of the Steel Corporation on December 31, 1910 (including with the capitalization the purchase-money obligations and real-estate mortgages, as in previous instances, but excluding $620,352 par value of stocks of subsidiary companies not held by United States Steel Corporation), was $1,468,033,260. The excess of the capitalization over the indicated investment ($1,186,982,038) was, therefore, $281,051,222, whereas at its organization in 1901 the disparity between the two figures was $720,846,817.[1] It is apparent, therefore, that a large part of the water in the capitalization, as it may be called, has been eliminated.

The Steel Corporation undoubtedly would contend that there was not a disparity of $281,000,000 between its capitalization and the actual value of its property at the close of 1910. Indeed, the Steel Corporation in its balance sheet of December 31, 1910, claimed total assets (after deduction of current liabilities) of approximately $1,693,000,000, or, roughly, $225,000,000 over and above the outstanding capitalization as above stated. Of this excess $164,000,000 was surplus and the balance sundry reserves. This balance sheet valuation, it will be seen, is about $500,000,000 in excess of the investment as computed by the Bureau.

The Steel Corporation in defending its 1910 book valuation undoubtedly would rely in the main upon two considerations—first, that there has been an appreciation in its natural resources, particularly ore, and second, that there is a so-called ''merger value'' attaching to its properties because of their combination and coordination under a single control.

So far as the ore is concerned, there has been no such marked appreciation as the Steel Corporation claims. Moreover, a considerable part of whatever actual appreciation has occurred in ore values undoubtedly is due to the rapid concentration of ore property in the hands of a comparatively few interests, and especially in the hands of the Steel Corporation itself.

With respect to ''merger value,'' it is probably true that the various properties acquired by the Steel Corporation, taken together with the organization of this company as a going concern, do have a value in excess of the sum of their values as separate entities. The coordination and integration made possible by the combination of such properties under a single control undoubtedly tend to reduce costs either through economies or through removing the necessity of paying profits to others. Further, in so far as the concentration of the industry under the control of a single concern gives to it a monopolistic power over production and prices, this may result in an increase in its earning power and consequently in an increase in its value as a going concern. This involves, however, the reduction of actual or potential competition. Indeed, much of what is ordinarily termed merger value, in so far as it exists, is to a greater or less degree a monopolistic value. To allow a single company, which has secured the bulk of a given industry, credit for such merger value, as a basis on which to earn profits, raises, therefore, a question of far-reaching public policy. In the absence or ineffectiveness of competition, either actual or potential, earnings might be obtained which, if capitalized at an ordinary rate of profit, would give a value or capitalization greatly in excess of the real investment. To regard a valuation so arrived at as justifying such profits under these conditions would be reasoning in a circle, because the real question is whether the profits themselves, used to determine the capitalization, were reasonable. For the reasonableness of profits, only two criteria are practically available, namely, first, the existence of free and fair competition, and, second, the rate of profit on the actual investment. Of these two criteria the second is the only practicable one available, where competition is not effective. Therefore both because of the vital issue involved, as well as because of the practical consideration of establishing an investment which shall permit of intelligent discussion of profits, the Bureau, while admitting there is an element of merger value in a going concern, either from great concentration of control, monopolistic power, or other influences, has made no addition therefor to the investment of the Steel Corporation.

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[1] In arriving at this figure the investment in 1901 was taken at the round sum of $682,000,000. (See p. 37.)

PROFITS OF THE STEEL CORPORATION.

The profits earned upon the investment of the Steel Corporation, as computed by the Bureau, have averaged 12 per cent for the entire period from 1901 to 1910. The extreme range was from 7.6 per cent in 1904 to 15.9 per cent in 1902.

In making a comparison of profits with investment, certain revisions of the profit statements as published by the Corporation in its reports were necessary to conform to the revisions made by the Bureau in the investment. Thus, as the Bureau has considered the investment as a whole and not merely the equity over and above bonded indebtedness, the total earnings on that investment, before payment of interest on such indebtedness, should be used; that is to say, the problem is to determine what the investment as computed by the Bureau has actually earned and not how the return on that investment has been distributed among the different security holders.

Therefore, the Bureau did not deduct interest charges from the earnings as reported by the Corporation. The usual operating, administrative, and general expenses were, of course, deducted, and also taxes, in accordance with the usual practice of corporations.

Moreover, the Bureau did not deduct certain locked-up inventory profits, so called; that is, intercompany profits on sales of materials between subsidiary companies, which have not been realized by final sale to outside interests. Such locked-up inventory profits are tentatively deducted from the earnings in the profit statements of the Corporation but are carried as a suspended surplus. While the treatment of this item is debatable, it appeared to the Bureau reasonable not to deduct such locked-up profits. Even assuming that a large part of these inventories were to be sold at figures which would fail to realize these provisional profits, on the other hand the Corporation probably would stock up again with low-cost inventories on which there would subsequently be an offsetting profit. It is a fair presumption that the bulk of these locked-up profits will eventually be realized.

The Bureau has also revised the profit statements of the Corporation by readjustment of depreciation charges. As shown above, in discussing the investment, a portion of the amounts provisionally set aside by the subsidiaries of the Corporation for depreciation really were excessive, judged from the standpoint of investment as computed by the Bureau, representing either unnecessary provisions or else amounts which were directly applied to capital additions to the property. The aggregate of these excess provisions during the period from 1901 to 1910 was approximately $38,000,000. This amount has therefore been restored by the Bureau (properly distributed by years) to the profits as shown by the Corporation's reports. (That portion expended in additions to the property has also been included in the investment.) The amounts written off from surplus by the Corporation itself to offset inflation of capitalization have not, of course, been deducted, since these have no bearing whatever upon the true depreciation of the property nor upon the true earning power of the Corporation.

There are one or two other items concerning which there might be some difference of opinion, as, for instance, the amounts set aside each year to provide for the issuance of stock on a profit-sharing basis to employees of the Corporation. Since, however, it might be argued that the amounts thus set aside really were equivalent to additional wages, and since they have been deducted from the gross earnings by the Corporation itself, the Bureau has allowed these deductions to stand.

The net result of the revisions made by the Bureau in the profit statements of the Corporation on account of these various items is indicated by the following table, which shows the net earnings as reported by the Corporation (these being the earnings before deducting interest on bonds of the United States Steel Corporation itself, and sinking-fund provisions on such bonds, but after allowing for sinking-fund provisions on bonds of subsidiary companies, which are in the main regarded as representing actual depreciation of property), together with the amounts restored or added by the Bureau, and the finally adjusted total:

ACTUAL EARNINGS OF STEEL CORPORATION ON ITS TOTAL INVESTMENT, AS COMPUTED BY BUREAU, 1901-1910.

Year.	Net earnings, as shown by annual reports.	Adjustments by Corporation in sundry accounts.	Amounts restored to earnings by Bureau.			Total adjusted earnings.
			Interest on bonds, mortgages, and purchase-money obligations of subsidiary companies.	Locked-up profits in inventories.	Excessive depreciation allowances.	
1901[1].......	$75,006,230.89	....	[2]$4,500,000.00	(3)	−$1,765,000.00	$77,741,230.89
1902........	108,534,374.25	−$1,207,886.84	6,113,584.34	(3)	8,062,272.00	121,502,343.75
1903........	83,675,786.51	− 5,427,540.33	6,553,861.06	(3)	9,354,851.00	94,156,958.24
1904........	[4]57,791,196.80	+ [4]13,108.34	6,573,146.54	−$1,254,336.48	− 631,165.00	62,491,950.20
1905........	96,432,595.93	− 99,253.78	6,710,214.73	6,307,189.83	3,480,088.00	112,830,834.71
1906........	125,966,938.13	− 90,501.19	6,561,478.70	2,739,403.74	8,216,388.00	143,393,707.38
1907........	133,244,929.28	− 681,515.52	6,492,195.42	9,744,692.51	6,616,572.00	155,416,873.69
1908........	74,882,529.11	+ 394,034.59	7,401,205.18	426,983.85	1,688,543.00	84,793,295.73
1909........	107,773,099.96	+ 548,445.08	7,887,178.18	2,617,395.54	1,981,460.00	120,807,578.76
1910........	116,738,157.80	− 818,182.64	7,263,453.66	2,751,307.08	1,281,348.00	127,216,083.90
Total.	980,045,838.66	− 7,369,292.29	66,056,317.81	23,332,636.07	38,285,357.00	1,100,350,857.25

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[1] Nine months.

[2] Approximated; this amount never computed by the Corporation.

[3] In these years these inventory profits were not deducted by the Corporation and hence need not be restored.

[4] After deducting employees' bonus fund, which in this year was taken out after stating net earnings, but which in other years is deducted before determining the net earnings.

In the following table the yearly earnings as thus computed by the Bureau are compared with the revised investment.

COMPARISON OF INVESTMENT OF STEEL CORPORATION, WITH TOTAL EARNINGS THEREON, AS ADJUSTED BY BUREAU, YEARLY, 1901-1910.

Year ended Dec. 31—	Total investment in tangible property.	Earnings as adjusted by Bureau.	
		Amount.	Per cent.
1901 [1]	$698,869,756	[1] $77,741,231	[2] 14.8
1902	763,574,919	121,502,344	15.9
1903	806,615,979	94,156,958	11.7
1904	818,238,143	62,491,950	7.6
1905	874,840,920	112,830,835	12.9
1906	947,397,884	143,393,707	15.1
1907	1,078,763,602	155,416,873	14.4
1908	1,090,425,487	84,793,296	7.8
1909	1,146,875,993	120,807,579	10.5
1910	1,186,982,038	127,216,084	10.7
Total		1,100,350,857	
Average	941,258,472	[3] 112,856,498	12.0

[1] Nine months, April to December; investment includes additions during this period.

[2] Indicated rate per annum based on actual earnings for nine months.

[3] Average yearly profits for nine and three-fourths years.

As already stated, the average for the period from April 1, 1901, to December 31, 1910, is 12 per cent. The average rate for the first four and three-fourths years was 12.5 per cent, as against 11.6 per cent in the five years from 1906 to 1910. Therefore, in so far as any tendency may be noted, it is toward a lower rate of profit in recent years.

The table shows that in the years 1904 and 1908, which were years of rather marked depression in the iron and steel business, the rate of profit of the Steel Corporation fell to 7.6 per cent on the investment in 1904 and 7.8 per cent in 1908, as compared with a maximum profit of over 15 per cent in 1902 and 1906. Prior to the formation of the Steel Corporation and other large consolidations, the iron and steel industry was noted for violent changes in the rate of profit, the industry, indeed, having been aptly termed either "prince or pauper." This table shows that so far as the Steel Corporation is concerned the business, although still subject to marked fluctuations in profits, has, even in the most depressed years of this period, shown a substantial return on the actual investment.

It should be pointed out that an average rate of 12 per cent for a concern of the size of the Steel Corporation, which embraces more than one-half of the entire iron and steel industry of the country, has a very different significance than the same rate in the case of a relatively small concern. While exceptionally efficient or fortunate concerns in the steel business may earn rates in excess of this average, on the other hand a great many of the less efficient companies undoubtedly earn very much smaller rates, while in some instances the business is conducted at a loss. Therefore, an average rate of 12 per cent for over one-half of the entire steel business of the country is much more significant than the same rate or even a larger rate for a comparatively small concern. It probably means that the return on a considerable proportion of the business of the country, which under more competitive conditions and more scattered ownership would be conducted at a lower rate of profit, has been considerably increased.

It may also be noted that the investment includes a large amount of idle property, particularly unimproved ore reserves, which, of course, tends to reduce the rate. However, the investment in undeveloped iron-ore property as computed by the Bureau is not so great as to very materially affect the rate of profit. Nevertheless it is worth emphasizing that the rate of profit here given includes not only the iron and steel industry proper, but also the iron-ore mining industry. Prior to the era of consolidation the latter, to a large extent, was distinct from the manufacture of iron and steel, and under the scattered ownership of iron-mining properties then prevailing profits generally are understood to have been comparatively low, on the average. Under present conditions in the iron and steel industry, however, the Lake iron-ore industry is one of the most profitable branches of the business. This factor should be considered, therefore, in comparing the profits of the iron industry at the present time with those obtained under the different conditions formerly prevailing.

The rate of earnings on the investment of the Steel Corporation as computed by the Bureau is, of course, considerably larger than the rate of net profit upon the capitalization, as indicated by the annual reports of the Corporation, because the investment as established by the Bureau is very much less than the capitalization. The rate of 12 per cent here given, it should be clearly understood, covers the entire investment in the property, whether represented by capital stock or bonded debt. This rate of earnings on the total true investment understates the rate which accrues to the benefit of the Steel Corporation (or the stockholders as distinguished from the stockholders and bondholders combined) on that part of the true investment which may be considered as represented by the capital stock. That is to say, if that part of the true investment for which bonds were issued were deducted from the total true investment, and a corresponding amount of bond interest at the rates paid by the Corporation were deducted from the earnings, then a comparison of the remainder of the investment with the remainder of the earnings would indicate a considerably higher average profit than 12 per cent. Such a computation, however, can not be made in a definite or satisfactory manner, particularly because the original

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bond issues of the Corporation did not correspond with the true value of the property for which they were issued. Therefore, to deduct them from the true investment would leave an unduly low remainder for the capital stock and unfairly exaggerate the rate of profit on that part of the true investment which may be considered as contributed by the stockholders.

Hence the Bureau does not attempt to give in definite figures the rate of profit earned by the Steel Corporation on the true investment represented by its capital stock, but merely calls attention to the fact that the rate of profit above shown is not the rate earned on that part of the true investment which may be considered as contributed by the stockholders, but a lower rate earned on the total true investment and accruing to the stockholders and bondholders combined.

POSITION OF STEEL CORPORATION IN THE INDUSTRY.

The Steel Corporation, despite its great size, is not exempt from competition. Indeed, the evidence on the whole indicates that competition in the industry has steadily been increasing. Notwithstanding the great additions made by the Corporation to its properties from earnings and the acquisition of several important competing concerns, its proportion of the business in nearly every important product except pig iron and steel rails is less than it was in 1901. This is shown by the following table of percentages compiled by the Corporation from its own figures in connection with data gathered by the American Iron and Steel Association:

PROPORTIONS OF OUTPUT OF PRINCIPAL IRON AND STEEL PRODUCTS PRODUCED BY UNITED STATES STEEL CORPORATION AND BY INDEPENDENT COMPANIES, RESPECTIVELY, IN 1901 AND 1910.

Products.	Steel Corporation's percentages.		Independent companies' percentages.	
	1901.	1910.	1901.	1910.
Pig iron, spiegel, and ferro	43.2	43.4	56.8	56.6
Steel ingots and castings	65.7	54.3	34.3	45.7
Rails	59.8	58.9	40.2	41.1
Structural shapes	62.2	[3] 47.0	37.8	[3] 53.0
Plates and sheets of all kinds [1]	64.6	[3] 49.7	35.4	[3] 50.3
Black plate produced in tin mills	79.8	52.9	20.2	47.1
Coated tin-mill products	73.1	61.1	26.9	38.9
Black and coated sheets produced in sheet mills	67.3	38.9	32.7	61.1
Wire rods	77.7	67.3	22.3	32.7
Wire nails	68.1	55.5	31.9	44.5
Wrought pipe and tubes [2]	57.2	38.2	42.8	61.8
Seamless tubes [2]	82.8	55.3	17.2	44.7

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[1] Includes sheets for tinning, galvanizing, and other coatings.

[2] These percentages are based on capacity and not production. The capacity of independent companies is, moreover, partly estimated.

[3] For 1909; figures for 1910 not available.

The Steel Corporation did not compute its percentage of the ore production of the country. Its proportion of the production of Lake Superior ore, such ore being practically the basis of the steel industry (arrived at by comparing the known production of the Steel Corporation with the total production as estimated by the Geological Survey), fell from 60.6 per cent in 1901 to 51.6 per cent in 1909 (figures for 1910 not being available).

This table shows that whereas the Steel Corporation in 1910 had fully maintained the share of the country's total production of pig iron which it held in 1901, its proportions of the production of nearly all steel products had declined, and in most cases sharply declined. The only important exception was steel rails. The maintenance of its proportion here is chiefly due to the erection of a very large rail mill at the new Gary plant and to the acquisition of the Tennessee Coal, Iron and Railroad Company, which had a considerable steel rail production.

Taking the production of steel ingots and castings as a basis it will be seen that the Steel Corporation's percentage of the total fell from 65.7 per cent in 1901 to 54.3 per cent in 1910. This figure, perhaps, is the best single criterion by which to judge the change in the Corporation's position in the steel industry from a producing standpoint. It will be seen that the Corporation's proportions of production of black plate, coated tin mill products, and black and coated sheets, fell off to a very marked extent, which indicates that competition has been particularly active in these branches. Its share of the production of wrought pipe and tubes and of seamless tubes likewise fell off very heavily. In wire products the Corporation has maintained its relative position rather better, but even in these there has been a marked recession in the percentages of the business done.

It should be noted that the decline in the production shown by this comparison of the 1901 and 1910 percentages was practically continuous for most products throughout the entire period. However, the actual output of the Corporation has shown a very great increase. For example, the Steel Corporation's production of crude steel ingots, which is typical of its total business, increased from 9,743,918 tons in 1902 (the first full year of operations) to 14,179,369 tons in 1910, an increase of 45.5 per cent.

While, however, these statistics clearly show the existence of active competition in production, it should be clearly pointed out that such competition has not been so evident with respect to prices, where it has been materially modified by the existence of a price policy described as "cooperation." This will be discussed in a later part of the report.

While the Corporation's proportion of the production of both raw materials and finished products thus shows a marked decrease, the proportions given do not fairly represent the true position of the Corporation in the industry as a whole. In iron ore, in particular, the Steel Corporation undoubtedly occupies a dominating position. The Corporation's holdings of what are now regarded as commercially available ores exceed those of all other iron and steel interests combined. It should be clearly understood that the ores of the Lake Superior region substantially form the basis of the steel production of the country at the present time. While the Steel Corporation has very extensive holdings of ore elsewhere, the great bulk of its ore holdings are in the Lake Superior district. In 1907 the holdings of the Steel Corporation in Minnesota, which State includes the Mesabi and Vermilion ranges, according to a carefully prepared schedule of the Minnesota Tax Commission, amounted to about 913,000,000 tons, or 76 per cent of the total ore deposits for the State.

The Corporation's proportion for the whole Lake Superior region, including the old ranges in Michigan, is apparently about the same. Authoritative data submitted to the Senate Finance Committee in 1909 by a prominent iron manufacturer with the Steel Corporation's consent showed that the Corporation itself then reckoned on about 1,625,000,000 tons of Lake ore, of which 1,258,000,000 tons was of the current commercial standard. An estimate of a prominent mining engineer, submitted to the Finance Committee at the same time, placed the total reserves of Lake ore of the commercial standard at about 1,600,000,000 tons. On this basis, therefore, the Steel Corporation would have had over 75 per cent of the total commercially available ore in the entire Lake Superior region. Of course, the ideas of the consulting engineer and those of the Steel Corporation's experts as to what were commercially available ores may have differed somewhat, but it is not likely that the proportion of ore controlled by the Steel Corporation as shown by these two estimates is too high, because both of these statements were submitted by the manufacturer in question together with extensive data for other ore supplies in the United States for the avowed purpose of proving that the proportion of the ore supply controlled by the Steel Corporation was less than 85 per cent of the total supply. In 1908 the commercially available ore of the Lake Superior region, as computed by the United States Geological Survey, for the Conservation Commission, was 3,500,000,000 tons, but the iron content assumed as a basis for available ore was considerably lower than in the two preceding estimates, thus greatly increasing the total quantity. This and other evidence indicates that the Survey estimate is not fairly comparable with that of the Corporation.

In this connection it may be stated that the chairman of the Steel Corporation, in his testimony before the Ways and Means Committee in 1908, admitted that the Corporation had control of the ultimate ore supply of the whole country. Later, however, in 1911, in testimony before a special committee of the House of Representatives, he materially modified that statement.

In discussing the Corporation's position in the ore industry account must be taken of the fact that new discoveries of ore are constantly being made, and also that when somewhat lower grades of ore become commercially available the total reserve will be greatly increased. The use of ore of much lower grade involves, however, much higher costs of production, so that any concern which has substantial control of the best grades of ore would under such circumstances be in a position to obtain an enormous increase in profits. Taking conditions as they are to-day, there can be no doubt that the Steel Corporation has control of the great bulk of the commercially available ores of the Lake Superior district, its proportion probably being about three-fourths of the total. In addition, of course, it has there a large amount of low-grade ore, as well as immense deposits in the South. The Corporation's total ore holdings may be conservatively placed at more than 2,500,000,000 tons.

The system of leasing ore mines, as employed in the Lake region, is important in this connection. A very large part (approximately two-thirds in 1910) of the Corporation's total holdings in the Lake region is held by lease. Frequently there is no initial investment in such leaseholds, and even where a bonus is paid it is usually small, while the minimum tonnage on which royalty must be paid, whether mining operations are conducted or not, is generally unimportant. The Hill lease is, of course, as above shown, a very marked exception in the last respect.

It will be seen, therefore, that this ore-leasing system, where there is no limit placed on the number of leases that can be combined under a single interest, greatly facilitates the gathering in by a great concern like the Steel Corporation of a vast amount of ore reserves, far in advance of any commercial need for them. This not only prevents others from getting such property but also secures to such a concern the benefit of any appreciation in value which may come about either from natural causes or as a result of this very concentration of ownership. Obviously, a system which thus lends itself to such marked concentration of ore property for many years in advance (a common term of lease being fifty years), at a comparatively small cost, involves questions of the highest public importance. It might be said that the lease system as thus applied in the Lake ore region really affords an opportunity for a wealthy interest to attempt a corner in ore reserves on what is, in effect, a margin basis. Of course, in such extensive acquisitions there is a decided speculative risk, just as in similar efforts to control commodity markets, particularly, the possibility of the discovery of available deposits elsewhere, or new methods of mining which may render what are now nonavailable ores available for present commercial purposes.

The dominating position in the ore industry enjoyed by the Steel Corporation through this great ownership of ore reserves is heightened because of its very marked degree of control of the transportation of ore in the Lake Superior district. The Corporation owns two of the most important ore railroads, the Duluth and Iron Range Railroad and the Duluth, Missabe and Northern Railway. The ore rates on these railroads are about 1 cent per ton-mile. Their operating expenses are very low, that of the Duluth, Missabe and Northern in 1910 being below 30 per cent of gross earnings as against an average of 66 per cent for all the railroads of the country. The net earnings of these ore railroads, which are chiefly from the ore traffic, are phenomenal. This has the practical effect of reducing the Steel Corporation's net cost of ore to itself at upper Lake ports and, on the other hand, of increasing that cost to such of its competitors as are dependent upon the Corporation's railroads for transportation.

Hence, not only on account of its great holdings of ore but also on account of these peculiar advantages enjoyed in the transportation of the ore the Steel Corporation occupies an extremely commanding position in the iron and steel industry. Indeed, in so far as the Steel Corporation's position in the entire iron and steel industry is of monopolistic character it is chiefly through its control of ore holdings and the transportation of ore.

CHAPTER I.

THE CONSOLIDATION MOVEMENT IN THE STEEL INDUSTRY.

Section 1. Purpose and scope of the investigation.

The Bureau's investigation of the iron and steel industry has been concerned with questions of organization, capitalization, investment and profits, prices and price control, and costs.

As a result of the era of consolidation which marked the close of the nineties. the greater part of the iron and steel industry of the country was transferred from a large number of actively competing and generally small concerns to a few large companies, more than one-half of the industry, indeed, being finally, in 1901, merged under the control of a single organization, the United States Steel Corporation. Such centralization of this great basic industry of the country necessarily involves considerations of utmost importance to the public welfare. This centralization has an especial significance, because it has resulted in concentrating the ownership of one of the most important natural resources of the country—iron ore.

This consolidation of the iron and steel industry was accompanied by a great increase in total capitalization. It may fairly be said that during the period from 1898 to 1901 the industry was recapitalized, and recapitalized on a basis far in excess of the actual investment. It therefore becomes important to determine the relationship between such capitalization and the investment represented thereby, and also to determine the profits earned upon such investment. For the purpose of intelligent analysis a brief review of the consolidation movement, and particularly of the causes which led to that movement, is essential. All these matters are taken up in the present part (Part I) of the report. In a subsequent part there will be taken up a study of prices and price control, with the particular object of determining the conditions under which prices have been established and how far they have been affected by the centralization of ownership just referred to. Another portion of the report will be devoted to a study of costs by principal products, with a view to furnishing a basis for discussing prices and profits of specific products, as distinct from profits as a whole in relation to the total investment.

The investigation has been restricted to concerns engaged in the iron and steel industry in the modern and narrower sense of the word; that is, the production of pig iron, crude steel (ingots) and semifinished steel (billets, slabs, sheet bars, etc.) and the simpler products which are now ordinarily manufactured at an iron and steel establishment and the rolling mills operated in connection therewith. Moreover, except for pig iron, the inquiry has been concerned with steel rather than with iron, which has largely been displaced by steel. The more important of the simpler steel products are rails, beams, plates, merchant bars, wire rods, tubes, and sheets. In addition, there are certain others in which the manufacturing process is carried somewhat beyond the rolling-mill stage, but usually connected closely with rolling operations, such as drawn wire, wire nails, galvanized sheets, and tin plate.[1]

On the other hand, the investigation has not embraced companies engaged primarily in the manufacture of such steel products as armor-plate, castings, or ordnance, nor the great variety of highly elaborated iron and steel products, such as tools, implements, and machinery; nor has much attention been paid to the foundry branch of the iron industry. Any attempt to include these branches in an investigation of this character would lead to such multiplication of detail as to obscure the primary features of the inquiry.

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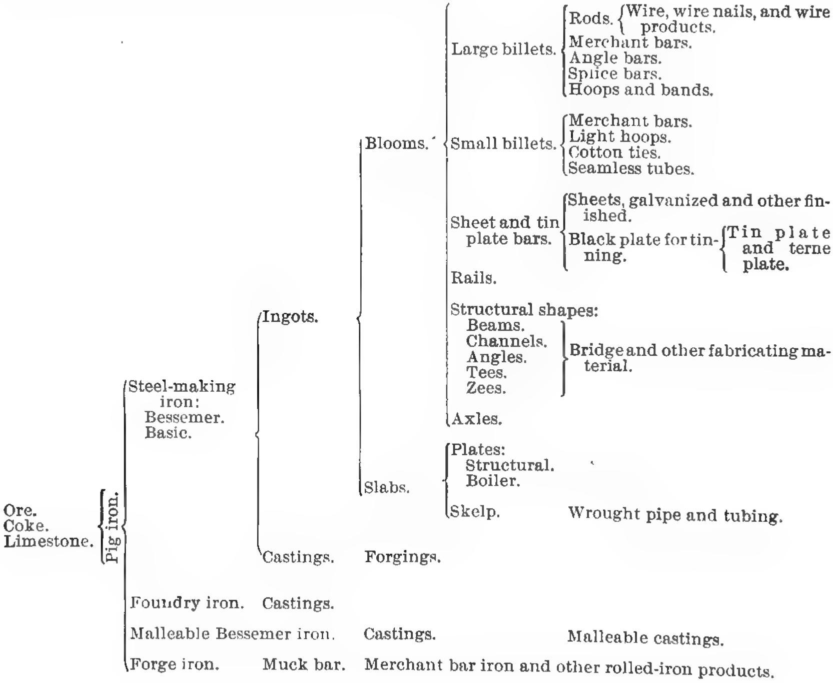
[1] An idea of the sequence of the stages in the production of the articles under discussion may be obtained from the following diagram:



The investigation has, in the main, been confined to a comparatively few concerns. Naturally, chief attention has been paid to the United States Steel Corporation, as by far the most important factor in the industry. The United States Steel Corporation and half a dozen other leading companies to-day handle substantially 75 per cent of the crude and simpler finished steel production of the country, the United States Steel Corporation alone doing rather more than 50 per cent of the total (its percentage originally was higher; see p. 365). For these large companies—as well as for a number of smaller, but important, concerns—extensive data were obtained by the Bureau respecting capitalization, properties, output, and costs.

I. PROGRESS OF COMBINATION PRIOR TO 1898.

Section 2. Occasional instances of consolidation in early nineties.

During the period from 1890 to 1900 there was a practically complete reorganization of corporate interests and relationships in the steel business. This was, of course, especially manifested in the enormous development of consolidation.

In 1890 there were scarcely any consolidations of the modern type in the steel industry. With only a few exceptions there were no concerns with a capitalization exceeding or even approaching $20,000,000. During the middle nineties there was a gradual change toward larger units, both by expansion and by combination; but the depressed conditions of that period were unfavorable to the organization of great corporations, and as late as 1898 the steel industry was characterized by the competition of a large number of independent concerns. The year 1898, however, witnessed a marked advance toward consolidation. This movement progressed with great rapidity in the next few years, until by the middle of 1901 substantially three-fifths of the steel industry of the country was concentrated under a single organization—the United States Steel Corporation—with an issued capitalization, including bonded indebtedness, of over $1,400,000,000.[1]

It would be incorrect to assume that this transformation was entirely the work of three and a half years. Instead, even in the early nineties there were some suggestions of the subsequent marked concentration. Not only were there a number of conspicuously large units at this time, but in some instances these were the direct result of consolidation. Thus, as early as 1889 the Illinois Steel Company had been organized with an annual pig-iron capacity of over 750,000 tons and with an authorized capital stock of $25,000,000, of which approximately $18,000,000 was issued at the time. This company was a consolidation of three previously competing steel concerns (see

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[1] Including the bonds of subsidiary companies. (See p. 112.)

p. 120), with plants at Chicago, Joliet, and Milwaukee. Again, in 1892, the Carnegie Steel Company (Ltd.), a partnership, was organized, with a capital stock of $25,000,000. This was the largest single unit in the industry at that time, its annual pig-iron capacity being approximately 1,200,000 tons. All of its plants were in the Pittsburg district. The company had some features of the modern consolidation, in that it had acquired several important competing steel works. It also had a substantial interest in the H. C. Frick Coke Company, the largest single factor in the coke industry. Since, however, most of the interests comprising it had long been affiliated, the Carnegie company at that time can hardly be regarded as a consolidation in the full modern sense of the term.

The Jones & Laughlin interests, in the Pittsburg district, were another important factor in the industry. In the early nineties these comprised two limited partnerships—Laughlin & Co. (Ltd.), with a capital stock of $900,000, operating the Eliza Furnaces, and Jones & Laughlins (Ltd.), with a capital stock of $4,000,000, operating the American Iron and Steel Works. These interests were at all times a prominent factor in the industry, and they later greatly expanded their operations.

Farther east there was the Lackawanna Iron and Steel Company, organized in 1891, with $3,750,000 capital stock, as a merger of the Lackawanna Iron and Coal Company and the Scranton Steel Company. The former concern had been incorporated in 1853 to operate coal mines and manufacture pig iron at Lebanon, Pa., and had erected a Bessemer steel plant in 1875. The Scranton Steel Company was organized in 1881 as a competitor.

Another large eastern concern at this period was the Pennsylvania Steel Company, organized in 1866, with a plant at Steelton, Pa. (not far from Harrisburg). In 1887 it organized a subsidiary concern—the Maryland Steel Company—and through it built a second plant, at Sparrow Point, Md., near Baltimore. The parent company was involved in difficulties in the depression of the early nineties and was reorganized in 1895 with a capital stock of $6,500,000. Subsequently this was greatly increased. (See p. 96.)

Two other concerns which should be mentioned in this connection are the Colorado Fuel and Iron Company, at that time the only important factor in the industry in the far West, and the Tennessee Coal, Iron and Railroad Company, the leading interest in the South. The Colorado Fuel and Iron Company was organized in 1892 with a capital stock of $13,000,000, as a merger of the Colorado Fuel Company and the Colorado Coal and Iron Company. It was chiefly interested in the operation of coal properties, although the Colorado Coal and Iron Company, one of the constituent concerns, had iron ore lands and a small steel plant. In the late nineties the company entered the steel business on an extensive scale.

The Tennessee Coal, Iron and Railroad Company had its beginning early in the fifties as a coal company. It first entered the iron business in 1881, its name being changed at that time from the Tennessee Coal and Railroad Company to the Tennessee Coal, Iron and Railroad Company. During the eighties and early nineties the company acquired several important coal and iron concerns. From this time on it has been the leading owner of such property in the southern iron district. The company, while a large producer of pig iron, did not enter the steel business proper until after 1898.

Several other concerns, like the Cambria Iron Company and the Bethlehem Iron Company, both of which were located in Pennsylvania, also were distinguished in the trade at this early date by the extent of their operations.

Most of these larger concerns just named were engaged chiefly in the production of the simpler and heavier forms of steel products, like rails, plates, and beams, or of semifinished steel (billets, slabs, bars, etc.) for the trade. As shown in the next section, many manufacturers of the more elaborated products—such, for instance, as nails, wire, tin plate, and tubes—did not at this early date produce the semifinished steel which they needed, but instead purchased their supplies of this raw material from large steel-making concerns such as those just described.

With respect to these simpler or heavier forms of steel, a comparatively small number of concerns had even in the early nineties assumed a preponderating influence. Thus, the Carnegie Steel Company (Ltd.), the Illinois Steel Company, the Jones & Laughlin interests, the Lackawanna Iron and Steel Company, the Pennsylvania Steel Company, the Cambria Iron Company, and the Bethlehem Iron Company probably controlled in 1898 not less than 50 per cent of the steel-ingot production of the country. These concerns were, however, distinct entities with respect to ownership, and despite the existence of price agreements, discussed later (see sec. 4), the distinguishing feature of the steel industry during this early period as a whole was active competition.

Outside of the companies engaged in the manufacture of the cruder or heavier forms of steel, there were comparatively few concerns of great magnitude in the industry in the early nineties, and very few consolidations. In the wire and nail trade, it is true, a $4,000,000 merger, the Consolidated Steel and Wire Company, had been organized as early as 1892. Generally speaking, however, the manufacture of such products as nails, tin plate, sheets, and bar iron was distributed among a large number of concerns, many of which were comparatively small, and competition in these departments of the industry, except as modified by pool and price agreements, was exceedingly active.

In the iron-mining industry substantially similar conditions existed. There were a few large concerns, like the Minnesota Iron Company, organized in 1882 with $10,000,000 authorized capital (later increased to $20,000,000), and the Lake Superior Consolidated Iron Mines, organized in 1893, with $30,000,000 capital stock. Each of these concerns owned an important ore railroad. (See pp. 122 and 148.) A few other iron-mining concerns were exceptionally prominent, but as a rule the ownership of iron-ore properties was widely scattered, and in this, as in the manufacturing branch of the industry, competition, rather than concentration, was the distinguishing characteristic, although this competition also was modified by price agreements.

Section 3. Integration in the early nineties not far advanced.

Another feature of the steel industry in the early nineties in contrast with conditions to-day was the comparative lack of integration. "Integration" may be defined as the assembling of the different successive branches of the industry, such as the production of iron ore and fuel and the manufacture of pig iron and steel products, under a single control. Each principal department of the industry was, to a considerable extent, although by no means wholly, distinct, so far as ownership was concerned. Thus, the production of ore, broadly speaking, was a business by itself, and comparatively few iron and steel companies had extensive holdings of ore lands. This was especially true of the ore supplies in the Lake region; in the East the ownership of ore lands by steel makers was rather more common. Moreover, a substantial proportion of the country's pig iron was produced by "merchant" furnaces, which sold their product instead of manufacturing it into more finished articles. Even the larger manufacturers of steel bought considerable quantities of pig iron. Again, the production of steel, as pointed out in the preceding section, was in the hands of a comparatively limited number of concerns, and most manufacturers of finished articles purchased their supply of semifinished steel instead of producing it. For the transportation of their products, either raw or finished, nearly all iron and steel companies were dependent upon railroad and vessel concerns, the ownership of which was entirely separate.

However, even at this early date the tendency toward integration, particularly through the acquisition of reserve supplies of ore and coal, had already taken shape. Naturally it was most marked in those sections where deposits of these raw materials were found in close proximity. Indeed in some sections of the country the iron and steel industry may be said to be integrated by nature. Thus, several iron and steel concerns in eastern Pennsylvania, where ore deposits were near the anthracite coal regions (anthracite for a long time being extensively used in the production of pig iron), had early made considerable investments in such properties. Similarly, in the Birmingham district in the South, the occurrence in close proximity of vast supplies of these basic raw materials very early led iron makers to adopt a policy of owning such property in connection with their furnaces and other plants.

In the numerous establishments of the Middle West, however, integration with respect to raw materials had made less headway. One reason for this was that many manufacturers in this section were largely dependent upon the Lake region for their supply of ore, while others were at some considerable distance from the coal regions. This physical separation of supplies of raw materials was naturally more or less accompanied by separation with respect to ownership. A further reason probably was that at this early date some steel manufacturers were not in a position to provide the additional capital necessary to carry extensive reserve supplies of ore and coal, although, with respect to ore, owing to the very general employment of the lease system in the Lake region (see p. 229), this was a secondary consideration. Furthermore, the fact that the ownership of the great ore and coal deposits of the country was at this early date scattered among a large number of interests who were in active competition made it practicable for iron and steel makers to rely upon the open market for their supplies of these primary materials.

Nevertheless, even in the Middle West considerable progress had been made by iron and steel makers toward the control of supplies of ore and fuel. Thus, the Illinois Steel Company in the early nineties had acquired a considerable acreage of coking coal lands in Pennsylvania, and it also had secured some iron ore lands in the Lake Superior region. Moreover, the ownership of the Minnesota Iron Company, which controlled extensive ore deposits in the Lake region, as well as a railroad and a fleet of Lake ore vessels, was partly in the hands of Illinois Steel Company capitalists. The latter company had, therefore, made decided progress in the direction of integration.

Another instance of integration was furnished by the Carnegie Steel Company (Ltd.). Through the H. C. Frick Coke Company, an allied concern, the Carnegie company had secured enormous reserves of coking coal. In the scale of its manufacturing operations, this company had made remarkable progress, and probably led all its rivals in this respect.

The Carnegie company, however, had not carried the policy of integration far with respect to the ownership of ore lands; instead, in the early nineties the company depended almost wholly for its supply of ore upon purchases in the open market, or upon short-time contracts with ore producers. In 1892 the first step in the direction of providing itself with a future supply of ore was taken in the acquisition of a half interest (which was later increased) in the Oliver Iron Mining Company, which at that time held leases of several important mines on the Mesabi Range. The annual supply of ore covered by this arrangement, however, was small in comparison with the Carnegie company's total requirements. Moreover, at this time Mr. Carnegie is said to have been decidedly opposed to the ownership of ore mines, and instead he preferred to let others assume the heavy speculative risks which then attended iron-mining enterprises. About 1896 the company completely reversed its policy in this respect. This change of policy, which is considered later (see p. 76), undoubtedly had considerable effect in directing the later course of events in the iron and steel industry as a whole.

While important steps toward making themselves independent with respect to supplies of raw materials, as well as toward concentration of manufacturing operations, had thus been taken in the early nineties by some of the leading steel companies, nevertheless a fair statement of the general situation in the steel industry at that time would be that this policy was confined to a comparatively few of the larger concerns, and that in the main it had not been carried far even by these.

Section 4. Early pools and price agreements in the steel industry.

It is clear from what has just been said that competition was the keynote of the iron and steel industry in the early nineties. However, the spirit of combination was by no means wholly absent. The mere fact that at this early date important consolidations had been organized in several other industries, notably in the case of oil, white lead, sugar, tobacco, and leather, shows that there was a general tendency in that direction. As a matter of fact, efforts toward concentration in the steel industry had been very numerous. As a rule, however, they had taken a less substantial form than the "trusts" which had been organized in some other industries, or the corporate consolidations of the present day. A common method of combination in the iron and steel industry at that period was a loose association, under which the individual concerns retained their identity and to a large extent their independence; certainly complete independence in ownership. Such unions, which assumed a great variety of form in detail, may roughly be grouped under two general types—the "pool" and the "gentlemen's agreement." They had been employed repeatedly in the iron and steel industry. Many of these combinations were short lived and ineffective. This was especially true of the gentlemen's agreement, which, as the name implies, was little more than an informal arrangement on the part of the members to abide by certain promises. The pool was a more formal and, in some instances, a much more effective organization.

Four typical pools in this early period were (1) the steel-rail pool, (2) the wire-nail pool, (3) the billet pool, and (4) the ore pool. These four pools are briefly described in the following pages. It should be understood that there were many other organizations of a similar character, and that these are discussed simply to illustrate different forms of such combinations. Such agreements will be referred to more extensively in a later part of the report.

THE STEEL-RAIL POOL.—By far the most important pool organization in the steel industry at this time was that in steel rails. This pool was formed on August 2, 1887, and, while it was dissolved in 1893, it was speedily renewed and continued in existence until the early part of 1897.[1] The general nature of this pool may perhaps best be indicated by reproducing the following copy of the memorandum of agreement:[2]

> *Memorandum of agreement, entered into August 2, 1887, by and between the North Chicago Rolling Mill Company, the Cambria Iron Company, the Pennsylvania Steel Company, the Union Steel Company, the Lackawanna Iron & Coal Company, the Joliet Steel Company, the Western Steel Company, the Cleveland Rolling Mill Company, Carnegie Brothers & Co., Limited; Carnegie, Phipps & Co., Limited; the Bethlehem Iron Company, the Scranton Steel Company, the Troy Steel & Iron Company, the Worcester Steel Works and the Springfield Iron Company.*
>
> We, the before-named companies and corporations, manufacturers of steel rails, hereby mutually agree one with the other, that we will restrict our sales and the product of steel rails of 50 pounds to the yard and upward, applying to orders taken by us and to be delivered by us or from our respective works during the year 1888, as hereinafter allotted and limited; and we respectively bind ourselves not to sell in excess of our current allotments, without first obtaining the consent of the Board of Control thereto—that is to say:
>
> It is agreed, there shall now be made an allotment of 800,000 tons of rails, which shall be divided and apportioned to and among the several parties hereto to be sold by them during the year 1888, upon the following basis of percentages, to wit: North Chicago Rolling Mill Company, 12½ per cent; Pennsylvania Steel Company, $9\frac{8}{10}$ per cent; Bethlehem Iron Company, 9 per cent; Carnegie Bros. & Co., Limited, and Carnegie, Phipps & Co., Limited (jointly), $13\frac{5}{10}$ per cent; Joliet Steel

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[1] Somewhat later it was revived.

[2] From Iron Age, November 16, 1893.

Company, 8 per cent; Lackawanna Iron & Coal Company, 8 per cent; Cambria Iron Company, 8 per cent; Scranton Steel Company, 8 per cent; the Union Steel Company, 8 per cent; Cleveland Rolling Mill Company, $4\frac{8}{10}$ per cent; Troy Steel & Iron Company, $4\frac{5}{10}$ per cent; Western Steel Company, $4\frac{5}{10}$ per cent; Worcester Steel Works, $1\frac{4}{10}$ per cent.

And in addition to the said allotment of 800,000 tons of rails above allotted, an additional allotment of 250,000 tons is hereby made and allotted to the Board of Control, to be reallotted and reapportioned by it, as and to whom it may deem equitable, in the adjustment of any differences that may arise. It being also further agreed that all subsequent allotments of rails hereafter made, to be sold under this agreement during the year 1888, shall also be divided and apportioned to the several parties hereto in the same ratio of percentages as said apportionment of 800,000 tons is herein divided and apportioned.

It is further agreed, that the Board of Control shall, from time to time, make such further allotments as shall be necessary to at all times keep the unsold allotments at least 200,000 tons in excess of the total current sales, as shown by the monthly reports of sales. This is to be in addition to the then unappropriated part of the 250,000 tons hereinbefore allotted to the Board of Control to adjust differences.

It is further agreed, on the first day of April, July and October, the Board of Control are authorized and directed to cancel such part of the unmade allotments of the respective parties hereto as they the said Board of Control shall determine such party unable to make in due time, and all allotments so canceled the Board of Control shall have the right to reallot to any of the other parties hereto; it being understood that all such cancellations shall apply only to allotments standing to the credit of the respective parties hereto on the dates above named, but no reallotment as aforesaid shall be made by the Board of Control to any of the parties hereto for the purpose of enabling them, or any of them, to make and sell rails from foreign made blooms.

It is further agreed, that all transfers of parts of allotments from one party to another shall be made by the Board of Control.

It is further agreed, that there shall be a Board of Control, consisting of three members, namely, Orrin W. Potter, Luther S. Bent and W. W. Thurston, who shall have power to employ a paid secretary and treasurer.

It is further agreed, that the Board of Control, upon the written consent of 75 per cent of the percentages as hereinbefore named, shall increase the allotments for the year 1888, and such increase shall be allotted to the parties hereto as hereinbefore provided.

It is further agreed, that each party whose name is hereunto annexed, shall and will make monthly returns to the Board of Control of all contracts for delivery of rails of 50 pounds to the yard and upward during the year 1888, and also of all shipments of such rails made by them during said year; a copy of such return shall be furnished to each party hereto.

It is further agreed, that all the parties hereto shall and will, on or before January 15, 1888, make a written return to the Board of Control of all rails of 50 pounds to the yard and upward (designating the weight) which they respectively had on hand January 1, 1888, stating whether the same are sold, and if sold, on what order they apply.

It is further agreed, that the Board of Control shall have the right whenever they deem it expedient to convene a meeting of the parties hereto, and they shall give at least ten days' previous notice of all meetings, and any business transacted at such meetings, and receiving 75 per cent of the votes present thereat, either in person or by proxy, shall be binding on all the parties hereto, excepting as to a change in percentages as aforesaid.

The Board of Control shall be required to call a meeting of the parties hereto when requested so to do in writing, signed by any three of the contracting parties, but such request and such notice shall state the object for which such meeting is called.

It shall be the duty of the Board of Control to have a proper record kept of all the returns made to it, with power from time to time to change the form of return as they may deem expedient.

The Board of Control shall have authority to levy an assessment, pro rata to the allotted tonnage, to defray the actual expenses made necessary to carry out this agreement.

It is further agreed, that we will, respectively, immediately make return to the Board of Control of all rails of 50 pounds to the yard and upward which we are now under contract to deliver during the year 1888, said return to state to whom such rails are sold and when they are to be delivered.

North Chicago Rolling Mill Company, by O. W. Potter, president; Cambria Iron Company, by E. Y. Townsend, president; Pennsylvania Steel Company, by Luther S. Bent, vice-president; The Union Steel Company, by H. A. Gray, secretary and treasurer; Lackawanna Iron & Coal Company, by B. G. Clarke, vice-president; Joliet Steel Company, by W. R. Stirling, treasurer; Western Steel Company, by A. M. Wilcox, president; Cleveland Rolling Mill Company, by Wm. Chisholm, president; Carnegie Bros., Limited, by D. A. Stewart, V. C.; Carnegie, Phipps & Co., Limited, by John Walker, chairman; The Bethlehem Iron Company, by Wm. W. Thurston, vice-president; The Scranton Steel Company, by W. W. Scranton, president; Troy Steel & Iron Company, Selden E. Marvin, secretary; Worcester Steel Works, by Samuel D. Nye, manager; The Springfield Iron Company, by Charles Ridgely, president.

This agreement, it will be seen, was designed to provide a very effective control of the production of steel rails by members of the pool, who together manufactured at that time more than 90 per cent of the country's output.

The distinguishing characteristics of the rail pool were a fairly compact organization and the inclusion of nearly all rail manufacturers, while the rather extensive plant necessary for the production of rails tended to discourage new competition. The bulk of railroad purchases of steel rails, moreover, are usually made once a year. These conditions favored the maintenance of pool prices and probably explain the stability of this pool as compared with others in the iron and steel industry at this period.

However, the rail pool was by no means completely successful. Despite its fairly compact organization, it collapsed in the latter part of 1893 as a result of disagreements over the allotment of tonnage, aggravated by the commercial depression of that year. In 1894, after numerous conferences, it was reorganized, but the slack demand of 1896 resulted in new infractions of the agreement, as a result of which the pool collapsed in February, 1897. This second disruption of the pool was followed by a brief but exceedingly bitter price war, during which sales of steel rails were made freely at prices ranging from $20 to $15 per ton. The nominal pool price of rails had for some time been $28.

THE NAIL POOL.—Next to the steel-rail pool, perhaps the most remarkable pool in the steel industry at this early period was the so-called wire-nail pool. This included manufacturers of cut nails as well; in fact, the official title was "The Association of Wire and Cut Nail Manufacturers." The formal organization of the pool, which had been preceded by temporary price agreements, was completed in the early part of 1895.[1]

The nail pool differed from the steel-rail pool, first, in that its membership was decidedly larger, and, second, in that the investment needed to engage in the business was comparatively small. It is claimed that an investment of $10,000 in nail machines was sufficient to permit the manufacture of nails on a practicable, although of course limited, scale. This organization was, therefore, at all times especially vulnerable to competition.

The general nature of this pool is well indicated by the following excerpt from an article in the Iron Age of December 3, 1896, shortly after its dissolution:

> The aim of the association was to control the market, both in the matter of production and prices. The determination of the percentages of the different manufacturers was obviously a matter of some delicacy, but the quota of each was satisfactorily determined on a three-fold basis—(1) actual sales in a given period of three months; (2) actual production of one of these months; (3) the capacity of the mill as shown in the number of machines. The average of these three elements determined the participation percentage of the different manufacturers. The association also regulated the amount of nails to be offered for sale each month and the price at which they should be sold.

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[1] See also page 75.

> The manufacturers in Canada were also negotiated with and a perfect understanding reached. Efforts were also made to keep European makers out of this market, but without much success. Not much difficulty was experienced in making it hard for outside manufacturers to obtain wire-nail machines, but this involved a considerable outlay on the part of the association. It was also found necessary after a while to have inspectors at all the factories to see that no irregularities were permitted, and this, together with the administration of the affairs of the association, entailed a heavy expense, to meet which a large proportion—latterly more than half—of the price paid by the merchant for nails was turned over by the manufacturers into the treasury of the association. A fund was thus created for the carrying on of the association, for payment of rebate to jobbers, for subsidies to outside makers, etc.
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> Another essential feature of the association's working was the control of the jobbers, who were * * * prohibited from purchasing nails made by outside manufacturers and from selling below the association prices. This involved the establishment of an elaborate system of prices, perhaps more detailed and comprehensive than was ever before attempted in the hardware line.

Immediately after its organization the pool advanced the prices of nails to an exorbitant figure. The " base " price was raised from $1.20 per keg in June, 1895, to $2.55 by May, 1896, or in less than twelve months. The real advance, however, was considerably greater than these figures indicate, owing to certain changes made in the methods of quoting nail prices. Thus, while the old base price applied to certain sizes of nails, no sizes were sold at the new base quotation, but instead large " differentials " were added for even the cheapest grades of nails. This feature of the nail " card," as it was called, was a source of acute irritation to customers of the pool.

The pool had a comparatively brief existence. About the first of December, 1896, or some eighteen months after its organization, it suddenly collapsed. Its failure was directly attributed at the time to the great increase in competition which resulted from its policy of exacting high prices. Such competition, as already pointed out, was facilitated by the fact that only a very moderate investment was necessary to enter the business on a commercial scale.

THE STEEL-BILLET POOL.—This pool was formed in April, 1896, under the name of " The Bessemer Steel Association of the United States." The agreement, which was along the same lines as that of the steel-rail pool, provided for a definite allotment of tonnage among the members, the maintenance of prices, the payment of penalties for exceeding the tonnage allotments, and compensation, on the other hand, to those members who did not make the maximum production to which they were entitled.

The billet pool had a stormy existence from the start. This was due partly to the fact that it failed to include several important manufacturers of billets, but more particularly to internal dissensions. An especial source of weakness was that while some of its members made nothing but the cruder steel products, such as billets, slabs, etc., and were therefore dependent upon the outside market, several of the larger concerns in the pool had their own finishing mills, which thus afforded them an outlet for a large quantity of their semifinished steel. The agreement as originally drawn up did not cover billets thus used by pool members themselves in the manufacture of finished products. As a result, such concerns took advantage of the situation by entering into heavy sales of finished material, and at prices so low that outside finishing mills were unable to compete and at the same time pay the pool price of billets. Consequently there was a heavy reduction in the trade demand for billets, and those members of the pool who were dependent upon this outside demand naturally became intensely dissatisfied. As a result of these conditions, the pool was apparently on the point of disruption during the summer and fall of 1896. In November the arrangement was amended by including in the tonnage allotment steel used by pool members in the manufacture of finished material as well as that sold in the cruder forms. This change, however, had hardly been accomplished when fresh difficulties arose over alleged bad faith of some of the members. In the first week of December, 1896, one member of the pool, the Bellaire Steel Company, formally announced its withdrawal. This action was promptly followed by the collapse of this pool.

THE ORE POOL.—This pool, which was called the Bessemer Ore Association, embraced the leading ore-producing interests in the Lake Superior region. The keen competition which ordinarily exists in a mining business where ownership of ore properties is scattered was intensified by the commercial panic of 1893, and profits, for many mining concerns, had practically disappeared. The pool agreement contemplated a rigid control of the business. Aside from fixing prices for ores, it also undertook to make a definite allotment of production, both as to mining ranges or districts and also as to the individual mining companies included in its membership.

Owing to important changes in the ore industry in 1896, some of which are noted later, the ore pool was threatened with disruption, and in the spring of 1897 it seemed almost certain that no agreement would be made for the coming season's business. An arrangement was nevertheless entered into by some of the leading producers, but on a very much lower basis as to price. Thus, whereas the standard price for Gogebic ores in 1896 had been $4 a ton, the basis in the 1897 agreement was about $2.75.[1]

OTHER POOLS.—Among other similar agreements in the steel industry in the middle nineties was that in structural steel, which undertook, in addition to the maintenance of prices, an allotment of tonnage; another important combination was the cast-iron-pipe pool, which was eventually declared illegal by the Supreme Court of the United States.[1]

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[1] See page 77.

Gentlemen's agreements.—These organizations were so numerous as to forbid specific description. It is safe to say that hardly any branch of the iron and steel industry was entirely free from such efforts to secure control of prices. The gentlemen's agreement proper was distinguished from the pool in that no formal organization for regulating output or prices existed, the efficacy of the agreement simply depending upon the faithfulness of the members in maintaining informal pledges. Such gentlemen's agreements contained no provision for forfeits in case of infraction, or for the acquisition or subsidizing of outside plants to prevent competition.

Section 5. Weakness of pool agreements a contributory cause of the organization of corporate consolidations.

Notwithstanding the various attempts at combination by means of pools and other agreements, such as those described in the preceding section, the statement holds true that competition was the dominating feature of the iron and steel industry in the early and middle nineties. This is, indeed, really indicated by the great difficulty experienced in maintaining pool agreements, which of course had no legal sanction. With the exception of the steel-rail pool, most of these organizations had a precarious existence, the agreements being subject to frequent violation. In the latter part of 1896, and the early part of 1897 in particular, there was a rather general abandonment of such combinations. Thus, the collapse of the wire-nail and billet pools was soon followed by the disruption of the steel-rail pool itself; a number of other similar agreements were also abandoned, at least temporarily, about this time. (In many instances similar agreements were again entered into at a later date. This matter will be dealt with in a later part of the report.)

These experiments at combination, however, undoubtedly tended to hasten the progress of the consolidation movement proper. The success, even though brief, of some of these pool organizations in securing large profits for their members had illustrated the advantages of concerted action. At the same time the low prices which followed the disruption of these associations, coming as they did after several years of acute depression in the industry, had a very discouraging effect, and manufacturers were ready to listen to almost any plans which promised increased profits. The failure of these pool agreements was, therefore, promptly followed by schemes for still more comprehensive and more permanent organizations. Thus, on the collapse of the wire-nail pool, several of the leading makers of wire nails, together with promoters, planned an absolute consolidation of the principal wire-nail interests of the country into a $75,000,000 corporation. This project fell through just as it appeared to be on the eve of consummation. However, about three weeks later a partial consolidation of wire interests was effected, and in January, 1899, practically the entire industry was concentrated in the hands of a single company. (See p. 129.) Similar consolidation schemes were taken up in various other departments of the steel industry. While these were not completed at once, the consolidation movement acquired a distinct impetus in 1897.

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[1] Addyston Pipe and Steel Company *v.* United States, 175 U. S., 211.

This new tendency of combination efforts was clearly recognized at the time, as may be seen from the following excerpt from a review by the Pittsburg correspondent of the Iron Age, published in the issue of that periodical for December 30, 1897:

> In writing under this head last year we said that there seemed to be only one way to successfully carry on business, and that was on the principle of "the survival of the fittest." Events of 1897 have confirmed this statement. The rail, beam, nut and bolt, and other pools have been dissolved, and the business goes to those concerns best equipped to take it. The rail pool was undoubtedly the most successful ever formed and made immense sums of money for the concerns composing it. In time, however, it became impossible to hold it together. Competition had sprung up and the subsidies demanded by outside concerns were so large that to pay them was becoming a burden.
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> The collapse of these pools showed very conclusively that pools, even where there were penalties involved, were not always successful, and another method of controlling certain lines of manufacture is being tried. This is by outright purchase and is now under way in the rod and wire trades. * * * Another deal which has been on the carpet for some time is an amalgamation of the bridge-building interests.

Section 6. Consolidation movement hastened by change in policy of Carnegie Steel Company toward ore supplies.

A specific influence which hastened outright consolidation in the steel industry was a radical change on the part of the Carnegie interests in their attitude toward ownership of ore reserves. The comparative indifference of the Carnegie concern in the early nineties to the control of ore properties was abandoned in the latter part of 1896, when the company executed a contract with the Lake Superior Consolidated Iron Mines (owned chiefly by Rockefeller interests; see p. 147), providing for the lease, for a period of fifty years, of ore properties capable of furnishing a large annual tonnage, at a royalty of 25 cents per ton. An important feature of the contract was that the transportation of this ore was to be over the Duluth, Missabe and

Northern Railway (the stock of which was held by the Lake Superior Consolidated Iron Mines), and down the Lakes in the vessels of the Bessemer Steamship Company, which was also a Rockefeller concern. Indeed, the contract appears to have been entered into by the Rockefeller interests mainly because of the assurance of a liberal tonnage for their rail and steamship properties thus afforded.

The circumstances which brought about this important deal are not definitely known. On the one hand, it was reported that the Carnegie interests had threatened to secure their ore supplies elsewhere unless the Lake Superior Consolidated Iron Mines agreed to this arrangement. On the other hand, there had been rumors that the Rockefeller interests were about to engage in the manufacture of steel.

The announcement of this arrangement practically demoralized the ore industry for the time being. Prices of iron-mining stocks dropped sharply. In this connection it may be noted that Henry W. Oliver, in a letter to H. C. Frick, chairman of the Carnegie Steel Company (Ltd.), under date of July 27, 1897, said:[1]

> I desire to impress upon you the fact, that if it had not been for our Rockefeller-Mesabi deal of last year, with the consequent demoralization in the trade caused by the publication thereof, it would not have been possible for us to now secure the other Range properties I propose to acquire, either by lease or for any reasonable price. We simply knocked the price of ore from $4 down to, say, $2.50 per ton. Now let us take advantage of our action before a season of good times gives the ore producers strength and opportunity to get together by combination.

In the steel industry the news of this transaction was very generally accepted as a depressing influence and as equivalent to a declaration on the part of the Carnegie interests that they proposed to put themselves in an impregnable position by effecting every possible economy in manufacture. The Chicago correspondent of the Iron Age referred to the transaction as "another decidedly depressing influence which is taken as portending much lower prices in the future."

The Carnegie interests were not slow to take advantage of this situation, and they followed up this deal by the lease of a large number of other mining properties in the Lake region, until, a few years later, they controlled an extensive reserve tonnage. The great bulk of these acquisitions was through lease and not by purchase in fee, so that only a comparatively small amount of capital was required for this purpose. (See p. 216.)

These leases of iron-mining properties by the Carnegie concern created a profound impression upon the trade. Statements were repeatedly made that the Carnegie Steel Company (Ltd.) proposed to make itself the dominating factor in the industry.[1] These acquisitions of ore property by the Carnegie interests were generally taken by other large steel manufacturers as a warning to strengthen their own positions with respect to reserves of ore and coal. Predictions were made by trade authorities at the time that the Carnegie purchases would be followed by a similar expansion or merger on the part of some of the rivals of that concern. These predictions proved to be well founded. Thus, in the summer of 1898, or within about eighteen months after the Carnegie-Rockefeller deal became generally known, the Illinois Steel Company and the Minnesota Iron Company were formally consolidated, together with some other properties, into the Federal Steel Company. (See p. 117.) As already stated, the ownership of the Illinois and Minnesota concerns had for some time been in part in the same hands, but the formal merger of these properties appears to have been hastened by the aggressive policy of the Carnegie interests. About the same time, moreover, several other consolidations in the steel trade were seriously considered and, although these projects were not then consummated, they well illustrate a tendency which rapidly became general in the industry.

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[1] "The Inside History of the Carnegie Steel Company," by J. H. Bridge. Mr. Oliver, who was closely allied with the Carnegie interests, was at that time urging the purchase by them of several important iron mines.

It is not intended to say that this change in the policy of the Carnegie Steel Company (Ltd.) was a principal cause of consolidation in the steel industry. Instead, the new policy of that concern was as much a result of broad changes in underlying trade conditions as a cause of such changes. This new departure on the part of the Carnegie concern, however, unquestionably did tend to focus the attention of the industry as a whole upon the growing tendency toward concentration and integration, and thus gave that tendency a still further impetus. A special reason for this was the practical consideration that these acquisitions of the Carnegie Steel Company (Ltd.) gave it many strategic advantages which tended to force a similar policy upon its rivals in mere self-protection.

II. CONSOLIDATION MOVEMENT, 1898–1900.

Section 7. Phenomenal progress of consolidation in all industries in these years.

The rather general failure of pool agreements and the growing tendency toward integration both favored the progress of outright consolidation in the steel industry. In the late nineties this movement assumed phenomenal proportions. It was not, however, confined to the iron and steel industry, but was characteristic of practically all the leading industries of the country at that time. The proportions of this consolidation "craze," as it is sometimes termed, may be appreciated when it is stated that the authorized capitalization of industrial consolidations, exclusive of consolidations of steam railways, street railways, gas, electric lighting, and similar public-utility concerns, exceeded for the single year 1899 a total of $2,000,000,000.[1] This enormous figure, however, really gives only an inadequate idea of the extent of consolidation in that year, since other similar projects, representing in the aggregate a capitalization of over $1,000,000,000, were seriously undertaken, but finally abandoned or deferred, largely owing to unfavorable developments in the stock and money markets, which in turn were chiefly attributable to the enormous congestion of securities created in that year.

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[1] The Engineering and Mining Journal, in its issue of January 2, 1897, in reviewing the iron and steel market for 1896, said:

> The situation in the steel market is now practically that the Carnegie company controls its own supply of ore; controls at a fixed rate all the Lake transportation which it needs; has well advanced toward completion a railroad line of its own from the nearest Lake port to its Pittsburg mills, on which the cost of transportation will be reduced to a minimum, and finally, through its auxiliary, the H. C. Frick Company, controls the greater part of the output of the Connellsville coke region. With its enormous plant, to which all the latest improvements and economies have been added, and with its raw materials practically furnished at bare cost, this company is not only in a position to make steel cheaper than any other producer; it is so situated as to be absolutely in control of the market, and make the prices of steel what it will. We have had pools and combinations without number in the iron market in this country, but never before a position like this, in which a single company could absolutely dominate the trade, and make any combination which can be formed simply the register of its own wishes. The situation is not altogether a comfortable one, and many are looking anxiously for the result.

Section 8. Extent of consolidation in the iron and steel industry in these years.

The extent of consolidation in the iron and steel industry in the three years 1898–1900 was such as to transfer to less than a dozen concerns more than one-half of the steel-making capacity of the country, so far as primary products are concerned. Three important concerns—the Federal Steel Company (see p. 87), the Carnegie Company of New Jersey (a reorganization of the former Carnegie and Frick interests), and the National Steel Company (a merger of several crude steel manufacturers competing with the Carnegie and Federal concerns, chiefly in Ohio)—together secured probably not less than 45 per cent of the steel-ingot production of the country. Over 90 per cent of the wire and wire-nail business was transferred to a single concern, the American Steel and Wire Company of New Jersey.[2] A large percentage of the production of welded tubes and bridge fabrication was acquired by the National Tube Company and the American Bridge Company, respectively, while the American Tin Plate Company secured a practically complete monopoly of its branch of the industry. The greater part of the sheet-steel business was similarly transferred to a single organization, the American Sheet Steel Company, while a smaller combination, the American Steel Hoop Company, merged the leading makers of steel hoops and cotton ties. Mention may also be made of the Shelby Steel Tube Company, a consolidation of practically all manufacturers of seamless tubing. Besides these consolidations which, as shown later, were acquired by the United States Steel Corporation, several others were formed in the iron and steel industry at this time.

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[1] Journal of Commerce and Commercial Bulletin of December 30, 1899.

[2] This concern, as pointed out on page 91, was preceded by a smaller, but important, consolidation, the American Steel and Wire Company of Illinois.

Some idea of the extent of the consolidation movement in that industry, as well as the enormous issue of securities which accompanied it, is afforded by the following table, which gives the leading iron and steel consolidations and their stock and bond issues. For convenience, the concerns given in the table are segregated into those which were later merged into the United States Steel Corporation and those which were not. The authorized instead of the issued capitalization is given. In most cases practically the entire amounts of stock authorized were actually issued. A conspicuous exception occurred in the case of the Federal Steel Company, which issued only about one-half of its $200,000,000 stock. About $4,500,000 of each class of the stock of the American Bridge Company was unissued, and several millions in the case of the American Tin Plate Company, the American Sheet Steel Company, the Republic Iron and Steel Company, the United States Cast Iron Pipe and Foundry Company, and a few others. The exact amounts of stock issued by most of these concerns appear elsewhere in the report.

TABLE 1.—LEADING CONSOLIDATIONS IN THE IRON AND STEEL INDUSTRY, 1898–1900.

A. Consolidations later merged into the United States Steel Corporation.[1]

Name and year of organization.	Preferred stock.	Common stock.	Bonds.
1898.			
American Steel and Wire Company of Illinois[2]	$12,000,000	$12,000,000	
Federal Steel Company	100,000,000	100,000,000	[3] $30,217,179
American Tin Plate Company	20,000,000	30,000,000	[3] 273,000
1899.			
American Steel and Wire Company of New Jersey	40,000,000	50,000,000	[3] 130,656
American Steel Hoop Company	14,000,000	19,000,000	
National Steel Company	27,000,000	32,000,000	[3] [4] 2,561,000
National Tube Company	40,000,000	40,000,000	
1900.			
American Bridge Company	35,000,000	35,000,000	[3] 156,000
American Sheet Steel Company	26,000,000	26,000,000	[3] 2,000,000
Carnegie Company of New Jersey[5]		160,000,000	[6] 185,081,813
Shelby Steel Tube Company	6,000,000	9,000,000	
Total	320,000,000	513,000,000	220,419,648

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[1] As noted in the text, in most cases practically all of the authorized securities were actually issued. The most conspicuous exceptions in this list were the Federal Steel Company, which issued rather less than $100,000,000 of stock; the American Bridge Company, which issued originally about $30,500,000 of each class; and the American Tin Plate Company, which retained in its treasury about $2,000,000 preferred and $2,000,000 common stock.

[2] This Illinois company was in 1899 merged into the New Jersey concern of the same name.

[3] Underlying bonds.

[4] Does not include $6,418,700 indebtedness incurred shortly after the organization of the company.

[5] This company was a consolidation of interests, most of which were previously affiliated and not competing.

[6] Including, in addition to the $160,000,000 bond issue of the Carnegie Company of New Jersey, $25,081,813 of underlying indebtedness, this including purchase-money obligations, and not merely bonds.

TABLE 1.—LEADING CONSOLIDATIONS IN THE IRON AND STEEL INDUSTRY, 1898-1900—Continued.

B. Consolidations not subsequently merged into the United States Steel Corporation.[1]

Name and year of organization.	Preferred stock.	Common stock.	Bonds.
1899.			
American Car and Foundry Company	$30,000,000	$30,000,000	
American Iron and Steel Manufacturing Company [2]	3,000,000	17,000,000	
Empire Steel and Iron Company [2]	5,000,000	5,000,000	
National Enameling and Stamping Company	10,000,000	20,000,000	[3] $600,000
Pressed Steel Car Company	12,500,000	12,500,000	
Republic Iron and Steel Company	25,000,000	30,000,000	
Sloss-Sheffield Steel and Iron Company	10,000,000	10,000,000	[3] 3,835,000
United States Cast-Iron Pipe and Foundry Company	15,000,000	15,000,000	
Virginia Iron, Coal and Coke Company		10,000,000	10,000,000
1900.			
Crucible Steel Company of America	25,000,000	25,000,000	
Total	135,500,000	174,500,000	14,435,000

[1] Several of the concerns in this group had not issued the full amount of their capitalization. The most conspicuous instances were the National Enameling and Stamping Company, which had issued about $21,700,000 of its stock; the Sloss-Sheffield Steel and Iron Company, the issued stock of which was $14,200,000; and the Republic Iron and Steel Company, which retained in its treasury about $7,500,000 of its stock.

[2] The capitalization of these concerns was later reduced.

[3] Underlying bonds.

The companies here given are chiefly those producing crude steel and the less highly finished forms of iron and steel products, such as rails, beams, bars, nails, tin plate, sheets, and pipe. The table does not include a large number of consolidations in the machinery trade or similar branches of the industry—such, for example, as the American Bicycle Company, with $30,000,000 capital; the Otis Elevator Company, with $11,000,000 capital; the International Steam Pump Company, with $27,500,000 capital; the American Radiator Company, with $10,000,000; the United Shoe Machinery Company, with $25,000,000; not to mention many others of almost equal size.[1]

A discussion of the enormous overvaluation involved in these figures of capitalization is reserved for the later chapters. It is sufficient to point out here that the issues of securities greatly exceeded the value of the assets acquired. This is indeed shown by the mere statement that a very common practice in the organization of these concerns was to issue preferred stock up to the full appraised value of all the assets, including working capital, and in addition an equal amount of common stock as a bonus, over and above which also large amounts of stock—frequently millions of dollars—were often issued to the promoters of these consolidations for their "commission."

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[1] The figures of capital stock issues here given are the amounts authorized at the time these companies were organized. In most cases they have been increased.

Section 9. General causes of consolidation in the steel industry, 1898–1900.

While the failure of the various pools in the iron and steel trade to establish permanently effective control over the production and prices of iron and steel products was undoubtedly an important cause of outright consolidation as a surer method of restricting or eliminating competition, consolidation was not, however, resorted to for this purpose alone. The underlying causes of consolidation in the steel industry, which were substantially the same as those operating in other great industries, may be defined as follows:

1. The restriction of competition.
2. Integration; that is, the linking-up of productive processes through the acquisition, under one control, of raw materials and manufacturing plants (and in some cases transportation facilities), and through extensions and coordination of manufacturing processes.
3. The creation of a great amount of inflated securities.

The first of these causes, namely, the restriction or elimination of competition, was undoubtedly the most potent. Indeed, the organizers of some of these great consolidations have admitted that a desire to control or eliminate competition was the chief reason for their formation. This was undoubtedly true of many consolidations in the steel industry. The iron and steel business in the United States, taken as a whole, had been extremely profitable, but the acute and extended commercial depression which occurred in the middle nineties sharply reduced profits, and steel manufacturers were attracted to consolidation as a means of increasing their returns. At the same time, moreover, there occurred great changes in the organization of the industry and in conditions of production, which resulted in sharper competition, generally speaking, than had previously prevailed. It is true that the low prices in the iron and steel trade at this time were largely due to lower costs of production consequent upon the changes in the new conditions of production, particularly with respect to the production of the chief raw material—ore—and with respect to more economical methods of manufacture. Not all producers, however, had adjusted themselves to these new conditions, and, moreover, the advantages of these lower costs were largely offset by severe competition, so that as a whole there can be no doubt that profits in the industry at this period were comparatively low.

Under these conditions it was difficult to maintain pools. The fact that they were expressly prohibited by law, even though the law was not often appealed to, was a further source of weakness in such agreements. An outright consolidation of competing interests, however, promised to afford not only a surer means of restricting competition (and one perhaps less likely to be attacked in the courts), but at the same time to furnish other advantages.[1]

The second cause, namely, the integration of industry (that is, the opportunity of securing economies and commercial advantages through larger and more highly coordinated enterprises), also had considerable influence in the formation of certain types of consolidation. This was especially true in the steel industry, where such integration has been introduced to an exceptional degree, extending from ownership and production of the primary raw materials to the manufacture of the finished product, and involving extraordinary improvements in methods of operation. The rapid industrial development of the country and the decreasing charges for transportation combined in the late nineties to extend the available or accessible marketing areas of all manufacturing enterprises, and therefore favored a great increase in the scale of production. The technical conditions of production also encouraged the development of plants of great capacity, particularly the increasing substitution of machinery for hand labor; integration, moreover, made possible the introduction of other important economies.

It is worth pointing out that the technical economies of integration were chiefly connected with combining and coordinating the successive stages of manufacture, which resulted in the saving of fuel for reheating the metal, of labor and time in the moving or handling of material, and in the utilization of by-products, such as blast-furnace gas.

As distinct from economies thus brought about through such enlargement and coordination of plants, consolidation afforded a means for saving the payment of profits to others on the purchase of materials. A conspicuous illustration of such commercial advantage through integration is found in the acquisition by large iron and steel manufacturers of control of extensive reserves of raw materials—ore and coal. Whereas in the beginning of the nineties most manufacturers, as already stated, were largely dependent upon the open market for their requirements of ore, by the close of the decade, as a result of this change, the control of large ore reserves had come to be regarded as essential to successful continuance in the industry. The great bulk of the iron-ore deposits of the Lake Superior region had by 1900 passed under the control of less than a dozen interests, chiefly steel-making concerns. The most desirable coking-coal fields of the East had been secured, largely by the same steel-making interests, with almost equal rapidity.

One of the chief advantages to be gained was the saving of the payment of profits to others on such materials. In the case of ore in particular this was an important consideration because of the rather effective control of ore prices from time to time by ore pools. The acquisition of such supplies of raw material, and the accompanying saving of expense thereby by one interest practically forced a similar policy upon others. If certain manufacturers were independent of the producers of raw materials or intermediate products through the operation of their own ore and coal mines, and the production of their own coke, pig iron, and crude steel, etc., obviously such manufacturers as were not in an equally independent position were exposed to considerable danger if the prices of any one of these raw materials or intermediate products were raised to a high level. Under such circumstances they would be obliged to pay high profits to the producers of such raw materials or intermediate products, while they would have to compete in the sale of finished articles with other producers who were not at that disadvantage. Indeed, it might happen at times that there would be much difficulty in getting the needed quantities of materials or intermediate products at all. Thus, when the integration of the various stages of production is extended to include the mining of raw materials and transporting them to the manufacturing plant, the advantage from integration is usually commercial rather than technical.

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[1] However, as already pointed out, pool agreements were not entirely abandoned.

Of course, the saving of the profits thus accomplished ordinarily necessitated an additional investment on the part of these steel concerns. Aside from any saving of profits, moreover, the advantage of having the assurance at all times of a liberal supply of raw materials was in itself important.

The third cause above enumerated, namely, the opportunity to obtain profits from flotation of new securities, was undoubtedly a very important influence in the consolidation movement. Indeed, the proportions of this movement were largely determined by the opportunity to market the securities thus created. So long as the demand for such issues was maintained the supply was steadily increased.

The importance of this stock-market factor in the consolidation movement, whether in the iron and steel industry or in other industries, is too often overlooked. Consolidation, while in large measure an outgrowth of technical and industrial conditions, was by no means exclusively so. Instead, there was frequently a marked reluctance on the part of owners to dispose of the businesses which they had built up, and in many cases the controlling inducement to sell out was the enormous price obtainable in the securities of these great consolidations.

The profits from this source were of two kinds—first, those made by the manufacturers who took stock in the new consolidations for the property or businesses which they transferred; and, second, those made by the promoters of these companies. In most cases the profit depended upon the issue and sale to the public of stocks and securities of a par value greatly in excess of the aggregate values of the assets of the consolidations thus formed; in other cases, the fact that a consolidation was so comprehensive as to give a substantial monopoly in a particular branch of the business made it possible for the former owners to realize a liberal profit by retaining the inflated securities thus created, and receiving the dividends paid thereon.

The huge "commissions," so called, obtained by the promoters of some of these concerns are discussed elsewhere. They frequently amounted to millions of dollars. (See pp. 176–180.) Out of the proceeds of such stock commissions usually some organization expenses had to be met, but in the main these commissions were intended as compensation to the promoters of these consolidations. It should be noted that the size of these commissions frequently was fixed by the promoters themselves, since they determined the capitalization of the consolidated company.

Section 10. General description of principal consolidations subsequently forming the United States Steel Corporation.

For a satisfactory discussion of subsequent developments in the iron and steel industry, a brief description of some of the principal companies enumerated in the preceding section is desirable, especially those which, as indicated in Table 1, later constituted the United States Steel Corporation.

Carnegie Company (of New Jersey).—This company was formed in March, 1900, as a reorganization and merger of the various Carnegie interests and the H. C. Frick Coke Company. (See p. 150.) It had an authorized capitalization of $160,000,000, and an authorized bond issue of the same amount. The new company did not go outside of this previously affiliated group of interests, and was, therefore, a reorganization rather than a consolidation, in the sense in which that word is commonly applied to many of the large corporations under discussion. The element of promotion was practically absent. The reorganization also resulted in a higher degree of integration. Among the more important subsidiary and allied concerns other than the H. C. Frick Coke Company were the Oliver Iron Mining Company, in which the Carnegie interests had by this time acquired a five-sixths share; the Pittsburg, Bessemer and Lake Erie Railroad, in which a majority stock interest was owned; the Union Railroad Company, operating a terminal railroad at Pittsburg; and various gas, water, and dock companies, as well as other miscellaneous interests.

The Carnegie Company was the largest single unit in the steel industry in the period under discussion. All of its manufacturing properties were concentrated in or near Pittsburg, this compactness of plant being a conspicuous feature of its organization. Its great size had been attained chiefly by an expansion of its own plants, or by the addition of concerns in correlated industries, such as coal and transportation, rather than by the absorption of competitors. An important exception to this general statement, however, was the acquisition of the Duquesne works. The company was noted for the efficiency of its management, its financial strength, and conservative policy with respect to the reinvestment of profits in the business, and by the fact that its securities were not publicly on the market, but held by a comparatively few individuals who had long been identified with the active conduct of the business. The company was, in fact, a close corporation, with practically no outside affiliations.

The Carnegie interests had by the beginning of 1900 become very strongly entrenched with respect to the reserves of all the principal raw materials. The company had assured itself of a long-time supply of very desirable ore in the Lake region. Most of its acquisitions had been acquired by lease and had involved comparatively small initial outlay, the bulk of the cost being paid in yearly installments in the form of royalties (see p. 216) as the ore was actually produced. With respect to coal and coke property the Carnegie interests—through the H. C. Frick Coke Company—had made very extensive purchases long before the era of consolidation. On the reorganization of the Carnegie interests in 1900 the H. C. Frick Coke Company held 40,000 acres of coking coal lands in addition to a large amount of surface land, about 11,000 coke ovens, aside from a large amount of mine equipment, dwellings, and miscellaneous property. The coking coal lands owned by the Frick company formed one of the most valuable assets of the Carnegie concern. The Carnegie Company also had very valuable natural-gas properties in the vicinity of Pittsburg.

While the company did not control the transportation of its ore by rail from mines to the head of the Lakes,[1] as did the Federal Steel Company, it acquired a fleet of six Lake ore vessels in 1899, and rapidly added others so that by the end of 1900 it was in a position to transport a very considerable part of its ore down the Lakes in its own boats. Moreover, as early as 1896, the Carnegie interests had acquired the Shenango and Lake Erie Railroad, running from Conneaut to Pittsburg, and also the Butler and Pittsburg Railroad, then under construction, both of which were consolidated in the latter part of 1896 as the Pittsburg, Bessemer and Lake Erie Railroad.

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[1] The Carnegie interests appear at one time to have contemplated the construction of a railroad of their own from some of their mines on the Mesabi Range to the head of the Lakes. In the late summer of 1899 they organized the Virginia-Ely Railroad Company under Minnesota laws. The project was, however, soon abandoned, apparently as the result of further contracts made by the Carnegie concern with the Rockefeller interests for a supply of ore and also for the transportation of ore to lower Lake points. These contracts, it should be noted, were quite distinct from the important arrangement of a similar character made between the same interests in 1896, as already described. (See p. 76.)

Immediately upon the acquisition of these railroads, the Carnegie interests virtually reconstructed them with a view to effecting the transportation of ore at a minimum cost. The size of the equipment, both engines and cars, was enormously increased, bridges were strengthened, and the road in large measure rebuilt. The most modern methods of unloading ore from steamers to cars at the docks and from the cars to furnaces at Pittsburg were introduced. The result was a very pronounced increase in the average train load and a marked reduction in transportation and handling costs per ton.

It is worth repeating that the Carnegie interests long before this had owned the Union Railroad, a belt line in the Pittsburg district, which added greatly to the efficiency of their plants.

The chief business of the Carnegie concern[1] was the manufacture of heavy steel products, such as steel rails, plates, axles, structural steel and bridge material, and various kinds of crude steel for the trade. Its annual capacity of ingots was about 3,500,000 tons and its capacity of finished products rather more than 3,000,000 tons, thus placing the company well in advance of its largest competitor, the Federal Steel Company, with respect to size. Its ingot production in 1900 was about 18 per cent of the country's total. It conducted every stage in the manufacture of its various products from the production of the raw materials up. Generally speaking, the Carnegie interests, up to the date of the organization of the New Jersey company, had confined themselves largely to the manufacture of heavier steel products of the character just described. Many of its best customers were manufacturers of finished steel, such as wire products, tubular goods, tin plate, and sheet steel. The company was, however, in a position to engage at short notice in the manufacture of more highly finished products, a fact which, as shown later (see p. 104), proved to be an exceedingly important consideration in bringing about the organization of the United States Steel Corporation.

Federal Steel Company.—This company was formed in September, 1898, with $200,000,000 authorized capital stock (of which about $100,000,000 was issued). It was a merger, through stock purchase, of the Illinois Steel Company, operating several large steel plants in or near Chicago and another at Milwaukee; the Minnesota Iron Company, which had extensive ore properties on the Vermilion Range and which also owned the Duluth and Iron Range Railroad and the Minnesota Steamship Company, thus providing for the transportation of its ore from mines to lower Lake ports; also, the Lorain Steel Company and the Johnson company (of Pennsylvania), with plants at Lorain, Ohio, and Johnstown, Pa. The consolidated company also acquired the stock of the Elgin, Joliet and Eastern Railway, a line of some 180 miles intersecting practically every railroad entering Chicago. This road directly served the Joliet works of the company and afforded connections with its other plants. The Illinois Steel Company itself also controlled a railroad, the Chicago, Lake Shore and Eastern, which connected its various plants in and about Chicago.

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[1] The Carnegie Company of New Jersey was a holding company. At its organization the properties of the old Carnegie Steel Company (Ltd.) were placed under the control of a new concern, the Carnegie Steel Company of Pennsylvania. For convenience in the discussion here given, these intercompany relationships are ignored.

The Federal Steel Company, like the Carnegie Company of New Jersey, was a holding company. Although a combination, the chief object of its formation apparently was not so much to eliminate competition as to secure an organization which should to a large extent be independently situated with respect to ore, fuel, and transportation, as well as manufacturing plants.[1] Moreover, while the two principal constituent concerns, the Illinois Steel Company and the Minnesota Iron Company, had been officially independent of each other, their securities had to some extent been owned by the same persons, so that the consolidation was really a welding of what might be called friendly rather than hostile interests.

The similarity between the Federal Steel Company and the Carnegie Company extended to the character of their output, the principal products of the Federal concern being steel rails, billets, plates. structural shapes, and other heavy lines and, like its Pittsburg rival, many of its best customers were themselves steel manufacturers. The annual ingot capacity of the company at the time of its organization was placed at about 2,000,000 tons. Its production, however, was considerably less, but represented about 15 per cent of the country's total at the date of its organization.

It will be noted that the Federal Steel Company's manufacturing properties were rather widely scattered, the company having plants at Milwaukee, Wis., Chicago and Joliet, Ill., Lorain, Ohio, and Johnstown, Pa. In this respect it differed sharply from the Carnegie concern, all of the manufacturing properties of which were compactly located in the Pittsburg district.

The extensive coal and ore properties brought into the consolidation by the constituent concerns were steadily added to by the Federal Steel Company management, and in numerous other ways the policy of integration which was already marked was carried further. Through the Illinois Steel Company it acquired some additional ore land in the Lake region and a considerable tract of coking coal land in the Connellsville district.

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[1] In this connection the following excerpt from the first annual report of the company may be cited:

> The plan is to own and control sufficient iron ore, coal, coke, and limestone and other raw products to supply all of the mills of the constituent companies; to own and control adequate facilities for transportation both on land and water; to manufacture and deliver finished steel, and to transact all business in connection with the same with the greatest economy.

With respect to transportation facilities, it is apparent that the Federal Steel Company was exceptionally well situated. Aside from owning the Duluth and Iron Range Railroad for the transportation of its ore from mines to the head of the Lake, the operation of the company's various properties was greatly facilitated by its ownership of other railroad properties, particularly the Elgin, Joliet and Eastern. Through the Minnesota Iron Company, moreover, the Federal Steel Company, at its organization, secured a fleet of 9 steel steamers and 7 steel barges, thus making the company largely independent of outside vessel interests for the transportation of ore on the Lakes.

NATIONAL STEEL COMPANY.—This company, formed in February, 1899, with $59,000,000 capital stock, all but $1,000,000 of which was issued at the time, ranked next in size to the Carnegie Company and the Federal Steel Company. It was a consolidation of several large concerns, chiefly in Ohio, making crude steel and heavy steel products; it also acquired two important furnace companies. It had the bulk of the crude-steel capacity in the territory immediately west of Pittsburg, other than that owned by the Federal Steel Company. While similar to the Federal and Carnegie companies in the character of its output, the National Steel Company differed from these in that it was distinctly a combination of previously competing concerns. A heavy stock bonus to the promoters was another conspicuous feature of its organization. The company was organized by W. H. Moore, who had also promoted the American Tin Plate Company, and who, prior to carrying through that deal, had never been prominently identified with the iron and steel industry.

The company's total annual pig-iron capacity in 1899 was in the neighborhood of 2,000,000 tons, and its capacity for steel about 1,700,000 tons. Its output of crude steel was about 12 per cent of the country's total. Its production was largely confined to semifinished steel, such as billets, sheet bars, and tin-plate bars, rather than finished products, even in the heavier lines. The company had a ready market for its steel production in these cruder forms because of its close affiliation with the American Tin Plate Company and the American Steel Hoop Company, and also with the American Sheet Steel Company, organized in 1900, all so-called "Moore concerns." The last three companies, and particularly the Tin Plate and the Sheet Steel companies, depended largely upon the National Steel Company for their raw material.

Through the Ohio Steel Company, one of its constituent concerns, the National Steel Company secured a one-fourth interest in a lease of the Biwabik mine, on the Mesabi Range. Shortly after its organization the consolidated company bought the Chapin mine, a valuable and extensive property, and also the Winthrop, these purchases including 9 ore steamers. It also acquired furnace and coke property from the Oliver & Snyder Steel Company, and, in addition, a twenty-year contract for a one-sixth interest in the ore production of the Oliver Iron Mining Company, the other five-sixths being secured by the Carnegie interests through ownership of a similar proportion of the stock of the Oliver concern. (The National Steel Company did not acquire any interest in the Oliver company's stock.) Thus, at the outset, the company adopted a vigorous policy of integration. In fact, integration was carried by this company to a point which fairly put it in the same general class with the Carnegie Company and the Federal Steel Company.

Furthermore, the close relationships among the four " Moore " companies gave the group as a whole a further degree of integration, particularly with respect to finished lines; that is to say, these companies as a group carried the production of steel into more highly elaborated forms than even the Carnegie or Federal concerns.

AMERICAN TIN PLATE COMPANY.—The American Tin Plate Company typifies that class of consolidations which were distinctly lacking from the standpoint of integration of productive processes, and which were primarily designed to control or eliminate competition in the sale of products. The element of promotion profits was also a conspicuous feature of its organization, no less than $10,000,000 of its $46,325,000 issued stock going for this purpose. (See p. 178.)

The tin-plate industry had had a phenomenally rapid growth, largely owing, no doubt, to the heavy import duty placed upon tin plate in the McKinley tariff. Indeed, the industry developed so rapidly that by the late nineties the country's output was practically sufficient for the home market.[1] This great increase in production was followed by extremely severe competition and sharp reductions in prices. The leading officers of the American Tin Plate Company, in subsequent testimony before the Industrial Commission, made no secret of the fact that a desire to restrict competition was largely responsible for its organization.

As already stated, the company was organized by W. H. Moore in the latter part of 1898. It acquired 39 different plants, embracing altogether 279 mills. This comprised almost every concern making tin plate at the time, and the new company had a closer approach to monopoly than did any other large steel consolidation; indeed, it may fairly be termed a monopoly so far as the industry in this country was concerned.

The policy of eliminating competition was still further manifested by negotiations undertaken by the company almost immediately after its formation to control the supply of tin-plate machinery, with a view of preventing the construction of independent tin-plate mills. In this it was not altogether successful. A number of independent concerns were started; several of these, however, were speedily bought up by the consolidated company, which, for several years, maintained not only a dominating, but substantially a monopolistic position in its branch of the steel industry.

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[1] Occasional exports of tin plate had, indeed, been made; on the other hand, some foreign tin plate was still sent to the Pacific coast, the relatively low rate by sailing vessel enabling British makers to compete in that section with the American product.

The company made practically a single product—tin and terne plate. As just shown, it purchased the semifinished steel which it needed, largely from the National Steel Company, with which it was closely affiliated through more or less common management.

AMERICAN STEEL HOOP COMPANY.—This company was organized in April, 1899, with $33,000,000 capital stock, all issued. It was primarily a combination of previously competing concerns, and a desire to limit competition and afford a large profit to the promoters was undoubtedly the ruling motive in its organization, which was conducted by W. H. Moore, together with other interests. The company was a consolidation of 9 concerns operating blast furnaces and rolling mills; its principal products were iron and steel bars, hoops and bands, cotton ties, and iron skelp. It was comparatively small, with an annual output of about 700,000 tons of finished product, exclusive of some surplus pig iron.

Shortly after its organization the company strengthened its position by the acquisition of important ore and coke supplies. As previously stated, it was closely affiliated with the National Steel Company.

AMERICAN SHEET STEEL COMPANY.—This corporation, organized early in 1900, was also one of the group of " Moore " steel companies.[1] It had $52,000,000 authorized capital stock, of which $49,000,000 was issued. It was virtually a counterpart of the American Tin Plate Company, in that it was organized to consolidate previously competing concerns, and in that it was engaged in the manufacture of practically a single product—sheets. Its annual capacity was in the neighborhood of 500,000 tons, this representing about 70 per cent of the country's total capacity at the time of its organization. The element of integration was hardly present in its case.

AMERICAN STEEL AND WIRE COMPANY OF NEW JERSEY.—This company also falls in that class of consolidations which were chiefly due to a desire to restrict competition and to realize a large promotion profit. The collapse of the wire nail pool in the latter part of 1896, as already pointed out, was followed by sharp price reductions, which promptly led to new efforts to effect a combination in the industry along more permanent lines. In March, 1898, several of the larger wire concerns were merged into a $24,000,000 concern—the

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[1] The Moore interests subsequently organized the American Can Company. This was not acquired by the United States Steel Corporation.

American Steel and Wire Company of Illinois. Within a year this company was consolidated with most of the outside wire makers into the American Steel and Wire Company of New Jersey, with $90,000,000 of capital stock, all issued.

The company's chief products were wire nails, plain wire, barbed wire, and wire fencing. It had a rod-mill capacity of something over 1,100,000 tons and a capacity for wire nails of rather more than 10,500,000 kegs.[1]

The company at its organization produced a part of its requirements of pig iron and crude steel, so that it enjoyed some degree of integration from the start. It immediately strengthened its position in this respect by the acquisition of extensive ore properties in the Lake region and considerable coking-coal and other coal land in Pennsylvania. One iron-ore mine alone, the Sauntry, was estimated to contain anywhere from 25,000,000 to over 75,000,000 tons. In a listing application submitted to the New York Stock Exchange in August, 1899, or about six months after its organization, the company estimated its reserve supply of coking coal to be at least 125,000,000 tons. Several hundred coke ovens were then in operation and more under construction. Somewhat later the company acquired an important fleet of vessels on the Great Lakes. (See p. 131.)

National Tube Company.—This company, formed in June, 1899, with $80,000,000 capital stock, all of which was issued, owed its organization chiefly to a desire to restrict competition and to the activity of promoters. It was a merger of 13 concerns. The largest of these was the National Tube Works Company, which had built up very comprehensive plants at Pittsburg and McKeesport, comprising blast furnaces, steel works, and rolling mills. (See p. 142.) The Riverside Iron Works, another large concern also acquired, had plants at Wheeling and Benwood, W. Va., and Steubenville, Ohio. It also owned considerable coking-coal property. Most of the other constituent concerns were smaller.

The principal product of the company was iron and steel wrought tubing. Its aggregate capacity was officially given in a listing statement to the New York Stock Exchange in February, 1900, at over 1,000,000 tons, or about 90 per cent of the country's total. It appears, however, that this was an overstatement, and that its proportion was perhaps not over 75 per cent. As shown later, the company was exceptionally successful, and this notwithstanding the fact that it did not carry the policy of integration as far as did some of the other large consolidations just described. While affiliated through banking connections with the Federal Steel Company (see p. 105), the location of most of the National Tube Company's plants was such that it depended very largely upon the Carnegie Company for a supply of the semifinished steel products which constituted its raw material. Later, however, the company planned to make itself more independent in this respect by the construction of additional steel plants and rolling mills for the production of semifinished steel. This change in policy, as shown later, had an important bearing upon the organization of the United States Steel Corporation. (See p. 103.)

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[1] Iron Age, January 12, 1899, page 21.

American Bridge Company.—This company, with $70,000,000 authorized capital stock, of which about $63,000,000 was issued, falls in the same general class as the American Tin Plate Company, the American Sheet Steel Company, the American Steel and Wire Company, and the National Tube Company, in that it was a consolidation of previously competing concerns. The plants entering the combination were unrelated units dependent upon the larger steel manufacturers for the steel which constituted their raw material, and the company was conspicuously undeveloped from the standpoint of integration of productive processes. It was concerned with a specialty; that is, as the name indicates, the erection of bridges. It also engaged extensively in the erection of steel construction for buildings. Its annual capacity was about 600,000 tons. It did not have as high a degree of control as some of the other consolidations here discussed.

The American Bridge Company, through banking connections, was affiliated with the Federal Steel Company and the National Tube Company, these three concerns often being spoken of as "Morgan" companies. There was no such marked affiliation from a manufacturing standpoint, however, as noted in the case of the "Moore" companies. This, as just shown, was partly due to the western location of the principal steel works of the Federal Steel Company, which made it impracticable to supply the Tube and Bridge concerns with their requirements of steel in competition with the Carnegie Company and other eastern concerns.

Shelby Steel Tube Company.—This company, capitalized at $15,000,000, was a consolidation of practically all the important concerns engaged in the manufacture of drawn or seamless tubing. A preliminary consolidation of several seamless-tube companies was formed in 1897 under a Pennsylvania charter; the new concern claimed to have about 90 per cent of the country's output at that time. In 1899 several other concerns were acquired, and in 1900 the company was reorganized under New Jersey laws. The company, it will be seen, manufactured a specialty, and it depended on other steel concerns for its supply of crude steel. In its own field it had for a time a substantial monopoly. Later the National Tube Company took up the manufacture of seamless tubing, and apparently cut into the business of the Shelby concern heavily.

Lake Superior Consolidated Iron Mines.—This company, organized in 1893, was largely owned by Standard Oil capitalists. Its outstanding capital stock in 1901 was about $29,400,000, all of one class. It was not engaged in manufacturing in any way, but was simply an ore-producing and transportation concern. It was virtually the counterpart of the Minnesota Iron Company in that it had extensive holdings of valuable iron-ore properties and an important ore-carrying road—the Duluth, Missabe and Northern. The controlling interest in this company, furthermore, was the owner of the largest fleet of ore vessels on the Great Lakes. (See p. 149.) As shown above, the company in 1896 entered into a very important ore contract with the Carnegie Steel Company (Ltd.). On account of its vast holdings of ore and its large transportation interests, the Lake Superior Consolidated Iron Mines occupied an exceedingly important position in the ore industry, and one which enabled it to secure favorable terms from the United States Steel Corporation when it was acquired by that concern in 1901.

Section 11. Other principal consolidations and companies in the steel industry.

Aside from the companies discussed in the preceding section, which were later acquired by the United States Steel Corporation, a number of other important consolidations in the steel industry were, as shown in Table 1, on page 81, organized in the late nineties. The more important of these concerns engaged in the manufacture of primary products were the Republic Iron and Steel Company and the Sloss-Sheffield Steel and Iron Company.

Republic Iron and Steel Company.—This company, incorporated in New Jersey in May, 1899, with $47,500,000 issued stock was a consolidation of iron rolling mills chiefly in Ohio and Indiana; it also took in some plants in the Birmingham district. In all it included 5 blast furnaces and about 30 rolling mills. Its capacity of bar-iron and rolled-iron products at its organization was approximately 1,000,000 tons.

The primary object of this consolidation was restriction of competition. A large stock bonus to the promoters was also a feature of its organization. However, the company even at its formation showed some degree of integration. Through subsidiary concerns it acquired several iron mines in the Lake Superior district, as well as coke property in the Connellsville region. It also had some southern ore and coal properties. Shortly after its organization a vigorous policy of concentration was adopted. A large number of rolling mills which were poorly equipped or badly located were dismantled and abandoned, and in their stead the company erected a large steel plant, at Youngstown, Ohio.

Sloss-Sheffield Steel and Iron Company.—This company, incorporated in August, 1899, was a consolidation of blast furnaces at

Sheffield, Birmingham, and Florence, Ala. The chief motive of its organization was a desire to secure greater integration and particularly to obtain control of additional coal and ore properties. The company dealt extensively in steam coal. It also had a large number of coke ovens, with an annual capacity of over 350,000 net tons; its pig-iron capacity (gross tons) was about the same. The company has never manufactured steel. The authorized capital stock of the company was $20,000,000, of which about $14,200,000 was issued.

Section 12. Expansion by older iron and steel concerns.

Concurrently with this organization of great consolidations, there occurred a reorganization and expansion of several other large concerns in the iron and steel industry. The more important instances of this sort are summarized in the following table:

TABLE 2.—REORGANIZATIONS AND EXPANSIONS OF IMPORTANT IRON AND STEEL COMPANIES NOT NEW CONSOLIDATIONS, 1898–1900.

Company.	Authorized capitalization just after time of readjustment.		
	Preferred stock.	Common stock.	Bonds.
Cambria Steel Company		[1] $50,000,000	
Colorado Fuel and Iron Company [2]	$2,000,000	23,000,000	[3] $6,950,000
Jones & Laughlins (Ltd.) [4]		20,000,000	
Lackawanna Iron and Steel Company [5]		25,000,000	
Pennsylvania Steel Company	25,000,000	25,000,000	[6] 7,000,000
Tennessee Coal, Iron and Railroad Company	1,000,000	23,000,000	12,603,000

[1] The original company of this name was incorporated in 1898 with a capital of $16,000,000 to lease the Cambria Iron Company. The company was reorganized with the above authorized capital in 1901.

[2] This company was incorporated in 1892. In 1899, however, it effected a rearrangement of its finances, its capitalization being increased to the figures shown above. Since then there has been a further increase in capitalization.

[3] Including underlying bonds.

[4] This company, which was organized in April, 1900, to succeed the former partnership, became in August, 1902, the Jones & Laughlin Steel Company, with a capital of $30,000,000 and an authorized bond issue of $10,000,000. The bond issue was subsequently increased.

[5] This company was an expansion of the Lackawanna Iron and Steel Company, of Pennsylvania, capitalized at $3,750,000. In February, 1902, this company was succeeded by the Lackawanna Steel Company of New York, with an authorized capital of $40,000,000, which was later increased to $70,000,000. The new company also has a large bonded debt.

[6] Underlying bonds.

Owing to the importance of these companies, brief mention of their organizations and operations may be made at this point.

JONES & LAUGHLINS (LTD.).—The two partnerships of the Jones & Laughlin interests noted on page 64 were in 1900 consolidated as Jones & Laughlins (Ltd.), with a capital stock of $20,000,000. The company was at this time a large manufacturer of billets and other crude steel, and the heavier classes of finished products, such as bars, plates, angles, and certain special lines. The company has since greatly expanded the volume and the scope of its business and has carried the policy of integration to an advanced point, until to-day it is perhaps the most important factor in the steel industry outside of the United States Steel Corporation.

LACKAWANNA IRON AND STEEL COMPANY.—The Lackawanna Iron and Steel Company in the latter part of 1899 determined to build a large plant on Lake Erie, near Buffalo, and in December of that year increased its capital stock from $3,750,000 to $25,000,000. In 1902 the Lackawanna Steel Company (of New York) was formed as the central concern with a capital stock of $40,000,000, since increased to $70,000,000, about half of which amount is issued; the company has also issued a large amount of bonds. The company manufactures all the heavier forms of steel, such as rails, bars, and beams, and it also has various finishing mills for lighter rolled products. It has extensive holdings of ore and coal property.

PENNSYLVANIA STEEL COMPANY.—In the early part of 1901 this company (see p. 64) was reorganized under New Jersey laws with an authorized capital of $50,000,000, of which $16,500,000 preferred and $10,750,000 common stock were issued. At this time a controlling interest in the company was acquired by the Pennsylvania Railroad. The company greatly extended its operations, a special feature being the acquisition of the very important Cuban ore property of the Spanish American Iron Company.

CAMBRIA STEEL COMPANY.—This concern was organized in 1898, with a capital stock of $16,000,000, to lease the property of the Cambria Iron Company (briefly described on p. 65) for a period of 999 years. Still later there was a further reorganization and increase in capitalization. The company later materially expanded its manufacturing operations. Its ore is chiefly derived from the Lake region, where it has important reserves.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—This company, which, down to 1898, was concerned with the operation of coal properties and the manufacture of pig iron, in that year began the construction of a steel plant at Ensley, Ala., for the manufacture of basic open hearth steel. A large increase in its investment was made at that time. The issued capital stock of the company in 1900 was about $23,000,000 and there was a bonded indebtedness of about $12,000,000. As noted elsewhere, in 1907 the Tennessee Coal, Iron and Railroad Company was acquired by the United States Steel Corporation, but at the period now under discussion it is properly grouped with the so-called "outside" steel companies. One of the most important assets of the company was its extensive ore property.

COLORADO FUEL AND IRON COMPANY.—The organization of this company has been sufficiently described on page 64. In 1899 the company greatly expanded its operations by the construction of a new

Bessemer steel plant, open hearth steel works, and finishing mills for the production of a large variety of steel products. At this time its authorized capital stock was increased from $13,000,000 to $25,000,000. In recent years the capitalization has been increased and the plants have been still further enlarged. As already pointed out, the company has important ore and coal properties.

Section 13. General tendency of leading concerns in the steel industry to secure greater integration.

From what has been said, it is apparent that as a rule the great iron and steel concerns, particularly those making crude and semifinished steel, were all striving at the close of the nineties thoroughly to fortify themselves for the future by acquiring liberal reserves of the two great raw materials, ore and coking coal, and by the erection of additional manufacturing plants. Moreover, several concerns which made more elaborated products, and which at their organization were wholly dependent upon other steel makers for their supplies of crude and semifinished steel, were also following the lead of these larger companies.

It is obvious that the Carnegie Company was in an exceptionally strong position. With respect to the expansion and coordination of manufacturing processes this company probably led all its rivals, the efficiency of its organization being a byword in the trade. Its reserves of ore were enormous and its holdings of coking-coal property far exceeded those of any other steel concern. It had an important advantage from the standpoint of transportation over most of its rivals in the Pittsburg district. It is true that the company did not have its own railroad transportation facilities for ore in the Lake region. The Carnegie concern, was, however, rapidly becoming independent with respect to the transportation of ore on the Great Lakes.

The Federal Steel Company, as shown, was also a very highly integrated concern, controlling not only the production of ore but also its transportation by rail to the head of the Lakes and by vessel to its principal manufacturing plants (those at Chicago, Ill., and Lorain, Ohio). It also had other extensive railroad facilities and a large amount of coking-coal property. The arrangement of its manufacturing properties was somewhat less compact than those of the Carnegie Company. However, it had some advantage in reaching western markets by reason of its Chicago location.

The National Steel Company, the central organization of the "Moore" group, while distinctly behind either the Carnegie Company or the Federal Steel Company, nevertheless, it will be seen, had, by the acquisition of ore and coal reserves and a fleet of ore vessels, attained a position of marked independence which it was steadily strengthening.

Furthermore, the close affiliations of this concern with the other "Moore" companies—the American Tin Plate Company, the American Sheet Steel Company, and the American Steel Hoop Company—tended to round out the operations of the group as a whole, and by assuring the National Steel Company of a market for practically all of its output of crude steel and pig iron it added a decided element of strength. While any one of these "Moore" concerns alone, with the exception of the National Steel Company, would have been distinctly vulnerable, their close affiliations made the group as a whole a very formidable factor in the industry.

These three concerns—the Carnegie Company, the Federal Steel Company, and the National Steel Company—were by far the most important and most strongly intrenched factors in the steel industry so far as those companies which later made up the Steel Corporation are concerned. Several of the crude-steel making companies which did not later enter the Steel Corporation were also well integrated. The location of some of these, however, or the character of their business, placed them in a rather different class than the companies just described.

Integration had, moreover, been carried to a considerable distance by the American Steel and Wire Company and a few of the other consolidations making the lighter steel products, but these companies were not in the same class in this respect with the larger concerns just referred to.

As shown in the following section, the marked degree of integration and concentration effected by large steel companies in the late nineties and the lack or incompleteness of integration by some of the other concerns had an exceedingly important bearing upon the formation of the United States Steel Corporation.

III. ORGANIZATION OF THE UNITED STATES STEEL CORPORATION IN 1901.

Section 14. Fundamental causes of this consolidation.

The fundamental causes of the formation of the United States Steel Corporation were substantially the same as in the case of the earlier consolidations described above, namely, (1) restriction or prevention of competition by combination; (2) integration; (3) stock inflation.

While in the case of the several consolidations thus far considered all three of these causes were not invariably present, all of them were factors in the organization of the Steel Corporation, and the same processes already described were repeated there in a more comprehensive manner and on a vaster scale.

The restriction of competition was the controlling motive in the organization of the Steel Corporation. While competition had already been greatly restricted in certain branches of the steel industry, a striking result of the consolidation movement above described was that competition was not thereby destroyed. Instead it soon developed that the formation of these great consolidations was likely to bring on an era of competition more severe than any the industry had yet experienced. This unforeseen outcome of consolidation, as explained below, was largely due to the tendency of these great consolidations to secure greater integration and thus to make themselves practically independent in all stages of production from the ore up.

The economies and commercial advantages rendered possible by integration through a still greater merger were also considerable, and, moreover, furnished a convenient argument in attempts to justify the merging of these competing concerns. (See p. 108.)

The third factor, namely, the inflation of securities, was also extremely important. The upward swing of trade and industry in the United States had not exhausted its vigor, and the business world was still ready to support vast commercial and financial undertakings.

There was thus brought about a temporary conjunction of conditions in the industry which presented an extraordinary inducement to prevent a bitter commercial conflict, and at the same time a remarkable opportunity to organize a consolidation which promised to yield unexampled profits from the flotation of an enormous amount of watered stock.

For a clear understanding of the real significance of the organization of the Steel Corporation, it is necessary to describe the situation in some detail.

Position of the steel industry.—The preceding discussion has shown that a remarkable condition had been reached in the iron and steel industry by the close of the year 1900. In the first place, the manufacture of crude and semifinished steel was largely in the hands of a comparatively few great concerns. The manufacture of several of the more finished lines, such as wire and wire products, tin plate, sheets, and tubes, moreover, had been substantially transferred to another group of consolidations, each of which with few exceptions had a more or less monopolistic position. These latter concerns were in great measure dependent upon the larger steel makers for a supply of their raw material, namely, semifinished steel. The larger steel concerns, on the other hand, were chiefly engaged in the manufacture of crude and semifinished steel or of heavier finished steel products, such as rails and structural material, which did not bring them directly in conflict with the group of concerns making the more elaborated products.

The relationships of the companies in these two groups to one another have already been partly indicated in the preceding discussion. These relationships had, however, such a vital bearing upon the organization of the Steel Corporation that they may be briefly summarized at this point.

The large consolidations which were subsequently merged into the Steel Corporation may be conveniently grouped in two classes—(1) the "primary group," or those making chiefly semifinished steel and heavy steel products, and (2) the "secondary group," consisting of those making lighter and more elaborated products.

The primary group of companies comprised the Carnegie Company, the Federal Steel Company, and the National Steel Company. Of these, the Carnegie Company was, of course, the most important. As already shown, it was a highly integrated concern, completely independent as to the production of its raw materials, and also pig iron and crude steel. It also had very important transportation facilities. The company, however, depended to a considerable extent for the marketing of its semifinished steel products (which comprised a very large portion of its total output) upon other steel manufacturers, who used such semifinished steel as their raw material. Some of its most important customers, in fact, were concerns in the second group of consolidations just noted.

The Federal Steel Company was in much the same general position as the Carnegie Company, being very thoroughly integrated, with extensive holdings of iron-ore and coking-coal lands, and with even more important transportation facilities. A rather larger proportion of its crude steel was worked up into finished forms (chiefly heavy lines) than in the case of the Carnegie Company; nevertheless, the company depended upon other steel manufacturers for an outlet for a part of its production.

The National Steel Company, while thoroughly integrated with respect to raw materials, was almost entirely dependent upon other manufacturers for a market for its steel, which, as already shown, consisted chiefly of such semifinished products as billets, sheet bars, and tin-plate bars. This company, however, had a ready market for the bulk of its steel products, because of its close affiliation with the other so-called "Moore" concerns, the Tin Plate, Sheet Steel, and Steel Hoop companies.

It is obvious, therefore, that all three of these steel-making concerns, despite their great size, were in a measure dependent upon other manufacturers.

A very important concern closely connected with this primary group of steel-making companies was the Lake Superior Consolidated Iron Mines, controlled by Standard Oil interests. This company had enormous holdings of ore in the Lake region, as well as a very important ore railroad to upper Lake ports—the Duluth, Missabe and Northern. Moreover, as previously stated, the controlling interests in this concern also controlled the Bessemer Steamship Company, which owned the largest fleet of vessels on the Great Lakes. These interests were not engaged in steel manufacture in any way.

The principal concerns in the secondary group were the American Steel and Wire Company, the National Tube Company, the American Tin Plate Company, the American Sheet Steel Company, the American Steel Hoop Company, and the American Bridge Company.

The American Steel and Wire Company, it will be remembered, originally had a substantially monopolistic control of the production of wire products in the United States. Its position with respect to its chief raw material, namely, steel billets, was not nearly so strong. Instead it purchased a very large proportion of its billet requirements. While the subsequent efforts of the company toward further integration through purchases of iron-ore and coking-coal properties, and the erection of additional blast furnaces, considerably improved its position in this respect, nevertheless it was not thoroughly integrated in 1900, and was still very largely dependent upon the large steel makers. However, it contemplated carrying the processes of integration much further by the erection of additional steel works of large capacity.

The National Tube Company, which at its organization acquired about 75 per cent of the production of iron and steel wrought tubing in the United States, was only partially integrated. While two of its principal plants, those of the old National Tube Works Company and of the Riverside Iron Works, embraced blast furnaces, steel works, and rolling mills (the Riverside concern, moreover, having considerable coking-coal property), the company nevertheless bought a large amount of its requirements of semifinished steel in the open market.

The American Bridge Company was not only somewhat weaker with respect to its control of its particular branch of the steel industry, but was almost entirely dependent upon other producers for its principal raw material—structural steel.

The American Tin Plate and the American Sheet Steel companies, both of which were "Moore" concerns, had a very high degree of control of their respective branches of the steel industry, particularly the Tin Plate concern, which, it will be remembered, originally enjoyed an almost complete monopoly of the production of tin plate. Neither of these concerns was integrated to any important extent; however, through their close affiliation with the National Steel Company, another "Moore" consolidation, they were well protected with respect to the requirements of their raw materials—sheet bars and tin-plate bars. The weakness of these concerns when considered individually was, therefore, partly made up through this close relationship with the National Steel Company.

The American Steel Hoop Company (also a "Moore" concern) was partially integrated at its organization, having a number of blast furnaces and steel works, in addition to its hoop mills; moreover, as already shown, the company after its organization acquired some iron-ore and coking-coal property. The affiliation of this company with the National Steel Company also somewhat strengthened its position. Nevertheless, the company was of decidedly subordinate importance in comparison with most of the other large concerns under discussion, and easily vulnerable to attack.

At the organization of these great companies, therefore, there was a marked degree of interdependence among them. For a short time after their formation this general situation was fairly well maintained. The three largest concerns—the Carnegie Company, the Federal Steel Company, and the National Steel Company—still restricted their operations for the most part to the production of crude steel or the cruder and simpler steel products which they had previously made, while those consolidations making more highly finished products continued to buy a large portion of their requirements of iron and steel from the principal steel-making concerns just named.

This balance or adjustment of trade conditions was, however, speedily disturbed. As already shown, the makers of the lighter forms of steel products began to extend the scope of their activities, or to plan such extensions, with a view to supplying themselves with the raw material of manufacture, namely, the semifinished steel hitherto purchased from others.

In other words, just at the time that concerns like the Carnegie and Federal Steel companies had extended their investment in raw materials and transportation facilities and had greatly enlarged their plant capacity, they were confronted with the loss of the patronage of some of their best customers, because the latter, in turn, had been extending their activities in the same directions. Under these circumstances a counterpolicy of extension into finished lines by the larger steel concerns became almost imperative. This counterstroke was, in fact, promptly threatened, and the whole industry was unsettled by the prospect of an era of extremely severe competition.

This threatened competition should be regarded particularly from two standpoints—first, it meant an enormous enlargement of productive capacity, and one which would apparently exceed the normal consuming power of the country for a long time to come, and, second, it meant the breaking down of the extremely profitable quasi-monopolies already established in particular products of the industry, such as wire, tubes, tin plate, and sheets. Both considerations obviously threatened to reduce profits in the steel industry to a decidedly lower level.

In the year 1900 the prospective loss of business for the great steel-producing companies, accompanied by a slackened activity in the trade, developed an exceedingly acute situation. The Federal Steel Company prepared to take up the manufacture of several lines of finished products, namely, structural material, universal plates, and tubes. In the summer of the same year it was reported that the Carnegie Company would go into the manufacture of wire rods on an extensive scale, thus "invading" the territory of the secondary group. This action was generally regarded as a blow at the American Steel and Wire Company, which had just threatened to erect additional blast furnaces and a large steel plant. Reports of further important plans of the Carnegie Company for extending its lines of production of finished products were current during the year 1900, and early in 1901 the definite announcement was made that the company was about to take up the manufacture of steel tubes in a new plant of enormous capacity, to be constructed at Conneaut Harbor, Ohio. This announcement, moreover, was made in such a way that it could be interpreted only as a declaration on the part of the Carnegie interests that they did not propose to submit idly to the loss of tonnage threatened by the plans of some of the larger consolidations making finished products, which previously had been among their largest customers. Not only was this the interpretation of the company's move placed on it by the trade, but it was expressly stated in a newspaper article as representing the attitude of Mr. Carnegie himself. This will be seen from the following excerpt:

> Mr. Carnegie's personal view of the situation may be authoritatively stated as follows: * * *
>
> The National Tube Company formerly obtained its steel billets from the Carnegie Company, but decided to erect blast furnaces and mills to supply itself. Naturally, the Carnegie Company then announced that it would be forced to erect mills to finish its own product into tubes.[1]

The intention of the Carnegie interests to extend their manufacture of finished lines had, indeed, been contemplated for some time. In an interview in the London Iron and Coal Trades Review of May 12, 1899, Mr. Carnegie was quoted as saying:

> Yes, we have been erecting several new departments, including what I believe will be the largest axle factory in the world. Why, it may be asked, should steel makers make plates for other firms to work up into boilers, when they can manufacture the boilers themselves? Or beams and girders for bridges, when they can turn out and build up the completed article, or plates for pipes when they can make the pipes? I think the next step to be taken by steel makers will be to furnish finished articles ready for use. In the future the most successful firms will be those that go the farthest in this direction.

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[1] New York Evening Post, January 21, 1901.

Furthermore this proposed entrance of the Carnegie concern into the tube business was regarded by the trade as the forerunner of still further projects. In fact, the announcement was almost immediately followed by a well-defined report that the Carnegie Company would at once invade the field of the American Sheet Steel Company by the erection of a sheet plant at Duquesne, capable of turning out 60,000 tons of sheets annually. Simultaneously there were reports that the company would speedily take up the manufacture of tin plate on a large scale.

This unmistakable evidence of an aggressive policy of retaliation on the part of the Carnegie concern, accompanied as it was by the important extensions into the manufacture of finished articles announced by the Federal Steel Company, revealed sharply the trend of the existing conditions, and naturally had a very disquieting effect in the trade and in financial circles. Both the trade journals and the financial press were filled with articles to the effect that a "battle of the giants" in the steel industry was at hand.

In such a contest it was apparent to all that the Carnegie Company, while likely at first to lose some business, might be expected in the long run to maintain, and even to increase, its dominating position in the industry. Its long established business, the modern character of its plants, its efficient technical and commercial organization, as well as its strong financial position, made it easily superior to any of its competitors. It had a distinct advantage in all these respects over even the Federal Steel Company, which was its largest rival, but whose plants were for the most part less modern and also widely separated geographically. There was no question that if the Carnegie Company, with its unlimited means and efficient organization, went into the manufacture of wire, tubes, sheets, or tin plate it would be more than able to hold its own against the respective large consolidations which produced those products, and which in their efforts to monopolize the business had been constrained to include in their respective organizations many plants of inferior character.

THE FINANCIAL SITUATION.—This unsettled trade situation was aggravated because of the importance which the securities of several of these steel concerns had assumed in the stock market. A period of violent competition in the steel industry would inevitably have been followed by a great decline in the value of these securities. A still more important matter was that the financial backers of some of these steel concerns had extensive commitments in other directions, which might be jeopardized by such an acute struggle in the steel industry. From the standpoint of these financiers, therefore, the situation presented at once a great danger and a great opportunity.

From a financial point of view there were four important steel groups, which were more or less distinct, namely, the Morgan group, the Moore group, and the Carnegie and the Rockefeller interests.

The Morgan group, which included the Federal Steel, National Tube, and American Bridge companies, enjoyed of course the advantage of a strong financial support, but these financial interests were extensively committed in other lines of business, especially in railroad financiering. They naturally would be especially concerned in preventing the outbreak of the threatened competition in the steel business. It may be noted that there were reports at this time that the Carnegie interests were contemplating the construction of a railroad from Pittsburg to the Atlantic seaboard. This threat, if made good, would have created an extremely disturbing factor in the trunk-line situation.

The Moore concerns, already described, were the most heavily overcapitalized and suffered from a distinctly speculative backing.

The Carnegie interests had abundant capital and credit, and their securities did not figure on the stock market, while their organization and management were unequaled. They were apparently in the best position of any of these groups to meet a price war.

The Rockefeller interests were entirely concerned with the production and transportation of iron ore. Their financial resources were of course abundant for any emergency. Their stocks did not figure to any appreciable extent on the exchanges.

The American Steel and Wire Company apparently was not closely affiliated with any of the foregoing groups. Despite its great earnings, its position was vulnerable. It apparently had no especial banking support.

It is evident, therefore, that, both from the point of view of the iron and steel industry and that of the stock market, the threatened outbreak of violent competition between these rival interests involved serious consequences. It might have meant the sudden termination of the extraordinary period of speculative activity and profit. On the other hand, an averting of this conflict by a merger of the various great consolidations, if successfully financed, would be a tremendous "bull" argument. It would afford its promoters an opportunity for enormous stock-market profits through the sale of its securities. The advantages to these interests, through the concentration of profits in different stages of the industry under a single control, would also be considerable, and there was undoubtedly some advantage to be gained through the further integration which such a consolidation would render possible.

It was clear to everyone that no consolidation of this sort could be made successful unless it included the Carnegie Company, which was the most powerful factor in the situation, which had long been noted for its aggressive tactics, and which, as above shown, had precipitated this crisis. Moreover, there can be little doubt that many interests in the steel industry regarded Mr. Carnegie's personal influence as a menace to their success, and desired to secure his retirement from the trade. At the same time the enormous earning power of the Carnegie concern would be an exceedingly important consideration both in the profits of the new company and also in facilitating the flotation of its securities.

The primary solution of the situation, therefore, from the standpoint of these interests, was to buy out Mr. Carnegie. Mr. Carnegie's well-known willingness to sell made the problem largely one of terms. Negotiations were promptly undertaken and speedily concluded by arranging to take over his large interest in his concern in exchange for bonds of the new consolidation. On March 2, 1901, announcement was made by J. P. Morgan & Co., as bankers, that arrangements had been completed for the organization of the United States Steel Corporation to acquire control of the following concerns: Carnegie Company (of New Jersey), Federal Steel Company, American Steel and Wire Company, National Tube Company, National Steel Company, American Tin Plate Company, American Steel Hoop Company, and American Sheet Steel Company.

The preliminary incorporation papers of the new company, under New Jersey laws, had already been taken out. The terms offered the constituent companies, which are given elsewhere (see p. 113), were speedily accepted by a great majority of the stockholders of these concerns, and, on April 1, 1901, within a very few weeks after the first serious intimation that negotiations were under way the United States Steel Corporation was definitely launched and in actual operation. The authorized capital stock was $1,100,000,000, equally divided between preferred and common shares. In addition there was a bond issue of $304,000,000 (exclusive of underlying indebtedness aggregating approximately $81,000,000, this including sundry mortgages and purchase-money obligations). About $425,000,000 of each class of stock and all of the bonds were issued for the companies named and for other purposes. Very soon after its organization the Corporation made three further important acquisitions, namely, the Lake Superior Consolidated Iron Mines, the Bessemer Steamship Company, and the American Bridge Company. It also acquired a one-sixth interest in the Oliver Iron Mining Company and the Pittsburg Steamship Company, the other five-sixths having been secured in the purchase of the Carnegie Company. During the following summer it purchased the Shelby Steel Tube Company. As a result of these acquisitions its issue of stock was increased to over $500,000,000 of each class, giving it an issued capitalization in stock alone of more than $1,000,000,000. (See p. 113.)

Thus, the threatened conflict in the steel industry was averted, while, as shown later, an unprecedented profit was reaped by the organization syndicate.

Table 3.—COMPANIES WHOSE STOCKS WERE ACQUIRED BY UNITED STATES STEEL CORPORATION AT OR SHORTLY AFTER ITS ORGANIZATION IN 1901, AND THE PRINCIPAL SUBCOMPANIES OR PROPERTIES OF THESE CONSTITUENT COMPANIES.

[The subsidiary companies or properties of the constituent concerns here given are those held by them on April 1, 1901. They may differ from those originally acquired by such constituent concerns, first, because some of the properties originally acquired by them were dismantled or abandoned, and, second, because the constituent concerns, as indicated on this table, organized some of these subsidiaries, and acquired additional properties. Moreover, a number of the plants given in this table were dismantled or abandoned immediately after the formation of the Steel Corporation. Such plants are indicated in italics. Most of the subsidiaries of the main constituent concerns were owned in fee in 1901. Those still held by stock ownership in 1901 are indicated by an asterisk.]

I. COMPANIES MAKING CHIEFLY CRUDE AND SEMIFINISHED STEEL OR THE HEAVIER FINISHED STEEL PRODUCTS.

CARNEGIE COMPANY (OF NEW JERSEY):

- * Carnegie Steel Company of Pennsylvania, owning—
  - Edgar Thomson Works, Bessemer, Pa.
  - Duquesne Works, Duquesne, Pa.
  - Homestead Works, Munhall, Pa.
  - Upper and Lower Union Mills, Pittsburg, Pa.
  - Carrie Blast Furnaces, Rankin, Pa.
  - Lucy Blast Furnaces, Pittsburg, Pa.
  - Howard Axle Works, Howard, Pa.
- * Pennsylvania and Lake Erie Dock Company (43.6 per cent).
- * New York, Pennsylvania and Ohio Dock Company (25 per cent).
- * Carnegie Land Company.
- * Conneaut Land Company.
- * † Oliver Iron Mining Company (83⅓ per cent)—
  - Owning a large number of active and inactive iron-ore properties on the Michigan and Mesabi Ranges, acquired from various independent mining companies.
- * Pewabic Company (50 per cent).
- * Pittsburg, Bessemer and Lake Erie Railroad Company (52 per cent).
- * Union Railroad Company.
- * † Pittsburg Steamship Company (83⅓ per cent).
- * Pittsburg and Conneaut Dock Company.
- * Pittsburg Limestone Company, Ltd. (75 per cent).
- * Carnegie Natural Gas Company.
- * Youghiogheny Northern Railway.
- * Mount Pleasant Water Company.
- * Youghiogheny Water Company.
- * Trotter Water Company.
- * Mingo Coal Company.
- * Union Supply Company.
- * H. C. Frick Coke Company—
  - Holding by direct ownership or through subsidiary companies about 40,000 acres of coking-coal land; 11,000 coke ovens; 3,500 dwellings, and other property.

FEDERAL STEEL COMPANY:

- * Illinois Steel Company—
  - South Chicago Works.
  - North Chicago Works.
  - Milwaukee Works.
  - Union Works.
  - Joliet Works.
  - * Southwest Connellsville Coke Company.
  - * Chicago, Lake Shore and Eastern Railway Company.
  - * Cundy Iron Company.
  - * Mount Pleasant Supply Company.
- * Minnesota Iron Company—
  - Owning various ore mines and undeveloped mineral lands in Minnesota.
  - * Duluth and Iron Range Railroad Company.
  - * Minnesota Steamship Company.
  - * Minnesota Dock Company (55 per cent).
- * Lorain Steel Company (Ohio)—
  - Steel plant at Lorain, Ohio.
- * Lorain Steel Company of Pennsylvania—
  - Steel plant at Johnstown, Pa.
    - (Formerly owned by the Johnson Company.)
- * Ingleside Coal Company.
- * Johnstown and Stony Creek Railroad Company.
- * Lake Terminal Railroad Company.
- * Elgin, Joliet and Eastern Railway Company.
- * Eureka Fuel Company.[1]
- * Masontown and New Salem Railroad Company.[1]
- * Huron Water Company (50 per cent).[1]

NATIONAL STEEL COMPANY:

- * Ohio Steel Company, Youngstown, Ohio—
  - * Biwabik Mine (25 per cent).
- King, Gilbert & Warner Company, Columbus, Ohio—
  - * Columbus Stone Company, Columbus, Ohio (66⅔ per cent).
- Shenango Valley Steel Company, New Castle, Pa.
- * Bellaire Steel Company, Bellaire, Ohio.
- * Aetna Standard Iron and Steel Company, Mingo

II. COMPANIES MAKING MORE HIGHLY ELABORATED PRODUCTS.

AMERICAN STEEL AND WIRE COMPANY OF NEW JERSEY:

- American Steel and Wire Company of Illinois—
  - Consolidated Steel and Wire Company (a consolidation, with 6 plants in 1901).
  - Salem Wire Nail Company, Salem and *Findlay*, Ohio.
  - H. P. Nail Company, Cleveland, Ohio.
  - American Wire Company, Cleveland, Ohio.
  - American Wire Nail Company, Anderson, Ind.
  - I. L. Ellwood Manufacturing Company, De Kalb, Ill.
  - Ellwood Wire and Nail Company, De Kalb, Ill.
- Washburn & Moen Manufacturing Company (4 plants).
- Worcester Wire Company, Worcester, Mass.
- Cleveland Rolling Mill Company, Cleveland and Newburg, Ohio.
- Oliver Wire Company, Pittsburg, Pa.
- Oliver & Snyder Steel Company, Pittsburg, Pa.
- Pittsburg Wire Company, Braddock, Pa.
- *Indiana Wire Fence Company, Crawfordsville, Ind.*
- *Garden City Wire and Spring Company, Chicago, Ill.*
- Consolidated Barb Wire Company, Joliet, Ill., and *Lawrence, Kans.*
- Laidlaw Bale Tie Company, Joliet, Ill.
- *Cincinnati Barb Wire Fence Company, Cincinnati, Ohio.*
- Union Rolling Mill Company, Cleveland, Ohio.
- *Portage Iron Company, Duncansville, Pa.*
- *Newburgh Wire and Nail Company, Newburgh, N. Y.*
- Allegheny Furnace Company, Allegheny, Pa.
- Shenango Valley Steel Company, New Castle, Pa.
- Shoenberger Steel Company, Pittsburg, Pa.
- *Puget Sound Wire Nail and Steel Company, Everett, Wash.*
- * American Mining Company.[4]
- * American Coke Company.[4]
- * Juniata Coke Company, Dawson, Pa. (50 per cent).
- * American Steamship Company.[4]
- * Edgar Zinc Company, St. Louis, Mo., and Cherryvale, Kans. (80 per cent).
- * Pennsylvania and Lake Erie Dock Company (19 per cent).
- * Huron Water Company (50 per cent).[4]

NATIONAL TUBE COMPANY:

- * National Tube Works Company, McKeesport and Pittsburg, Pa.
- Riverside Iron Works, Wheeling and Benwood, W. Va., and Steubenville, Ohio.
- Pennsylvania Tube Company, Pittsburg, Pa.
- Oil City Tube Company, Oil City, Pa.
- National Galvanizing Works, Versailles, Pa.
- Syracuse Tube Company, Syracuse, N. Y.
- Delaware Iron Company, New Castle, Del.
- Allison Manufacturing Company, Philadelphia, Pa.
- Cohoes Tube Works, Cohoes, N. Y.
- Ohio Tube Company, Warren, Ohio, and Norristown, Pa.
- American Tube and Iron Company, Middletown, Pa., and Youngstown, Ohio.
- Chester Pipe and Tube Company, Chester, Pa.
- Oil Well Supply Company, Pittsburg, Pa.
- * Western Tube Company, Kewanee, Ill.
- * Pittsburg Tube Company, Pittsburg, Pa.
- * Pennsylvania and Lake Erie Dock Company (7 per cent).

SHELBY STEEL TUBE COMPANY OF NEW JERSEY:

- * Shelby Steel Tube Company of Pennsylvania—
  - Shelby Steel Tube Company of Ohio—
    - *Garwood Seamless Tube Company, Garwood, N. J.*
    - Ellwood Weldless Tube Company, Ellwood City, Pa.
    - Greenville Tube Company, Greenville, Pa.

AMERICAN TIN PLATE COMPANY:

- American Tin Plate Company, Elwood and *Montpelier*, Ind.
- * New Castle Sheet and Tin Plate Company, New Castle, Pa.
- Shenango Valley Steel Company, New Castle, Pa.[6]
- Monongahela Tin Plate Company, Pittsburg, Pa.
- United States Iron and Tin Plate Manufacturing Company, McKeesport, Pa.
- National Tin Plate Company, Monessen, Pa., and Anderson, Ind.
- Pittsburg Tin Plate Works, New Kensington, Pa.
- Pennsylvania Tin Plate Company, New Kensington, Pa.
- Star Tin Plate Company, Pittsburg, Pa.
- Humbert Tin Plate Company, Connellsville, Pa.
- Washington Steel and Tin Plate Mills, Washington, Pa.
- Crescent Sheet and Tin Plate Company, Cleveland, Ohio.
- Falcon Tin Plate and Sheet Company, Niles, Ohio.
- Beaver Tin Plate Company, Lisbon, Ohio.
- Irondale Steel and Iron Company, Middleton, Ind.
- La Belle Iron Works, Wheeling, W. Va.[6]
- Wallace, Banfield & Co., Irondale, Ohio.
- Aetna Standard Iron and Steel Company, Bridgeport, Ohio.[6]
- Atlanta Steel and Tin Plate Company, Atlanta, Ind.
- *Baltimore Tin Plate Company, Baltimore, Md.*
- *Blairsville Rolling Mill and Tin Plate Mill, Blairsville, Pa.*
- *Cincinnati Rolling Mill and Tin Plate Company, Cincinnati, Ohio.*
- Great Western Tin Plate Company, Joliet, Ill.
- Ellwood Tin Plate Company, Ellwood City, Pa.
- Johnstown Tin Plate Company, Johnstown, Pa.
- Laughlin Nail Company, Martins Ferry, Ohio.
- Morewood Company, Gas City, Ind.
- *Neshannock Sheet and Tin Plate Company, New Castle, Pa.*
- Ohio River Sheet and Tin Plate Company, Rochester, Pa.
- *Hamilton & Co., West Newton, Pa.*
- *Marshall Bros. & Co., Philadelphia, Pa.*
- Britton Rolling Mill Company, Cleveland, Ohio.[6]
- Canonsburg Iron and Steel Company, Canonsburg, Pa.
- * National Mining Company (33⅓ per cent).[3]
- Morton Tin Plate Company, Cambridge, Ohio.
- *Cumberland Steel and Tin Plate Company, Cumberland, Md.*
- * Champion Iron and Steel Company, Muskegon, Mich.
- Reeves Iron Company, Canal Dover, Ohio.

AMERICAN SHEET STEEL COMPANY:

- Cambridge Iron and Steel Company, Cambridge, Ohio.
- Cambridge Manufacturing Company, Cambridge, Ohio.
- Canton Rolling Mill Company, Canton, Ohio.
- *Corning Steel Company, Hammond, Ind.*
- Dennison Rolling Mill Company, Dennison, Ohio.
- Dresden Iron and Steel Sheet Company, Dresden, Ohio.
- Falcon Iron and Nail Company, Niles, Ohio.
- *P. H. Laufman & Co., Ltd., Paulton, Pa.*
- Saltsburg Rolling Mill Company, Saltsburg, Pa.
- Midland Steel Company, Muncie, Ind.
- Old Meadow Rolling Mill Company, Scottdale, Pa.
- Piqua Rolling Mill Company, Piqua, Ohio.
- Cincinnati Corrugated Company, Piqua, Ohio.
- Struthers Iron and Steel Company, Struthers, Ohio.
- *Pittsburg Steel Manufacturing Company, Shousetown, Ohio.*
- *West Penn Sheet Steel Works, Leechburg, Pa.*
- Chester Rolling Mill Company, Chester, W. Va.
- Hyde Park Iron and Steel Company, Hyde Park, Pa.
- Kirkpatrick & Co., Ltd., Leechburg, Pa.
- Chartiers Iron and Steel Company, Carnegie, Pa.
- Scottdale Iron and Steel Company, Ltd., Scott-

AMERICAN STEEL HOOP COMPANY:

- * Isabella Furnace Company, Pittsburg, Pa.
- William Clark & Sons, Pittsburg, Pa.
- Lindsay & McCutcheon, Pittsburg, Pa.
- J. Painter & Sons, Pittsburg, Pa.
- Monessen Steel Company, Monessen, Pa.
- Union Iron and Steel Company, Youngstown, Warren, and Girard, Ohio.
- Pomeroy Iron and Steel Company, Pomeroy, Ohio.
- Portage Iron Company, Ltd., Duncansville, Pa.
- P. L. Kimberly & Co., Greenville and *Sharon*, Pa.
- * Mahoning Ore and Steel Company (20 per cent).
- * National Mining Company (33⅓ per cent).[3]
- * Union Ore Company (50 per cent).
- * Pennsylvania and Lake Erie Dock Company (8⅓ per cent).
- * Etna and Montrose Railroad Company.

AMERICAN BRIDGE COMPANY:

- American Bridge Works, Chicago, Ill.
- Berlin Iron Bridge Company, East Berlin, Conn.
- Buffalo Bridge and Iron Works, Buffalo, N. Y.
- Carnegie Steel Company, Limited (Keystone Bridge Company, bridge and structural plant), Pittsburg, Pa.
- * Detroit Bridge and Iron Works, Detroit, Mich.
- Edge Moor Bridge Works, Wilmington, Del.
- Elmira Bridge Company, Elmira, N. Y.
- Gillette-Herzog Manufacturing Company, Minneapolis, Minn.
- Groton Bridge and Manufacturing Company, Groton, N. Y.
- Hilton Bridge Construction Company, Albany, N. Y.
- Horseheads Bridge Company, Horseheads, N. Y.
- * Koken Iron Works, St. Louis, Mo.
- LaFayette Bridge Company, La Fayette, Ind.
- Lassig Bridge and Iron Works, Chicago, Ill.
- Nelson & Buchanan Company, Chambersburg, Pa.[5]
- New Columbus Bridge Company, Columbus, Ohio.
- Pittsburg Bridge Company, Pittsburg, Pa.
- Post & McCord, Brooklyn, N. Y.
- Rochester Bridge and Iron Works, Rochester, N. Y.
- Schultz Bridge and Iron Company, Pittsburg, Pa.
- Shiffler Bridge Company, Pittsburg, Pa.
- Union Bridge Company, Athens, Pa.
- J. G. Wagner Company (bridge and structural plant), Milwaukee, Wis.
- Wrought Iron Bridge Company, Canton, Ohio.
- Youngstown Bridge Company, Youngstown, Ohio.
- * A. & P. Roberts Company, known as Pencoyd Bridge Works, Pencoyd, Pa.
- * Toledo Bridge Company, Toledo, Ohio.
- * Alabama Bridge and Iron Company, Decatur, Ala.
- * New Jersey Steel and Iron Company, Trenton, N. J.

III. MISCELLANEOUS.

- * Conneaut Land Company.
- * † Oliver Iron Mining Company (83⅓ per cent)—
  - Owning a large number of active and inactive iron-ore properties on the Michigan and Mesabi Ranges, acquired from various independent mining companies.
- * Pewabic Company (50 per cent).
- * Pittsburg, Bessemer and Lake Erie Railroad Company (52 per cent).
- * Union Railroad Company.
- * † Pittsburg Steamship Company (83⅓ per cent).
- * Pittsburg and Conneaut Dock Company.
- * Pittsburg Limestone Company, Ltd. (75 per cent).
- * Carnegie Natural Gas Company.
- * Youghiogheny Northern Railway.
- * Mount Pleasant Water Company.
- * Youghiogheny Water Company.
- * Trotter Water Company.
- * Mingo Coal Company.
- * Union Supply Company.
- * H. C. Frick Coke Company—
  - Holding by direct ownership or through subsidiary companies about 40,000 acres of coking-coal land; 11,000 coke ovens; 3,500 dwellings, and other property.

ERAL STEEL COMPANY:

- llinois Steel Company—
  - South Chicago Works.
  - North Chicago Works.
  - Milwaukee Works.
  - Union Works.
  - Joliet Works.
  - * Southwest Connellsville Coke Company.
  - * Chicago, Lake Shore and Eastern Railway Company.
  - * Cundy Iron Company.
  - * Mount Pleasant Supply Company.
- innesota Iron Company—
  - Owning various ore mines and undeveloped mineral lands in Minnesota.
  - * Duluth and Iron Range Railroad Company.
  - * Minnesota Steamship Company.
  - * Minnesota Dock Company (55 per cent).
- * Lorain Steel Company (Ohio)—
  - Steel plant at Lorain, Ohio.
- * Lorain Steel Company of Pennsylvania—
  - Steel plant at Johnstown, Pa.
    - (Formerly owned by the Johnson Company.)
- * Ingleside Coal Company.
- * Johnstown and Stony Creek Railroad Company.
- * Lake Terminal Railroad Company.
- * Elgin, Joliet and Eastern Railway Company.
- * Eureka Fuel Company.[1]
- * Masontown and New Salem Railroad Company.[1]
- * Huron Water Company (50 per cent).[1]

NATIONAL STEEL COMPANY:

- * Ohio Steel Company, Youngstown, Ohio—
  - * Biwabik Mine (25 per cent).
- King, Gilbert & Warner Company, Columbus, Ohio—
  - * Columbus Stone Company, Columbus, Ohio (66⅔ per cent).
- Shenango Valley Steel Company, New Castle, Pa.
- * Bellaire Steel Company, Bellaire, Ohio.
- * Aetna Standard Iron and Steel Company, Mingo Junction, Ohio.[2]
- Buhl Steel Company, Sharon, Pa.
- Sharon Iron Company, Ltd., Sharon, Pa.
- Thomas Furnace Company, Niles, Ohio.
- * Ohio Iron Company, Zanesville, Ohio.
- * Rosena Furnace Company, New Castle, Pa.
- * National Mining Company (33⅓ per cent).[3]
- * Chapin Mining Company.
- * Winthrop Iron Company.
- * Standard Connellsville Coke Company, Pleasant Unity, Pa.
- * Continental Coke Company, Uniontown, Pa.
- * Mutual Transportation Company.
- * Menominee Transit Company.

- Newburg, Ohio.
- Oliver Wire Company, Pittsburg, Pa.
- Oliver & Snyder Steel Company, Pittsburg, Pa.
- Pittsburg Wire Company, Braddock, Pa.
- *Indiana Wire Fence Company, Crawfordsville, Ind.*
- *Garden City Wire and Spring Company, Chicago, Ill.*
- Consolidated Barb Wire Company, Joliet, Ill., and *Lawrence, Kans.*
- Laidlaw Bale Tie Company, Joliet, Ill.
- *Cincinnati Barb Wire Fence Company, Cincinnati, Ohio.*
- Union Rolling Mill Company, Cleveland, Ohio.
- *Portage Iron Company, Duncansville, Pa.*
- *Newburgh Wire and Nail Company, Newburgh, N. Y.*
- Allegheny Furnace Company, Allegheny, Pa.
- Shenango Valley Steel Company, New Castle, Pa.
- Shoenberger Steel Company, Pittsburg, Pa.
- *Puget Sound Wire Nail and Steel Company, Everett, Wash.*
- * American Mining Company.[4]
- * American Coke Company.[4]
- * Juniata Coke Company, Dawson, Pa. (50 per cent).
- * American Steamship Company.[4]
- * Edgar Zinc Company, St. Louis, Mo., and Cherryvale, Kans. (80 per cent).
- * Pennsylvania and Lake Erie Dock Company (19 per cent).
- * Huron Water Company (50 per cent).[4]

NATIONAL TUBE COMPANY:

- * National Tube Works Company, McKeesport and Pittsburg, Pa.
- Riverside Iron Works, Wheeling and Benwood, W. Va., and Steubenville, Ohio.
- Pennsylvania Tube Company, Pittsburg, Pa.
- Oil City Tube Company, Oil City, Pa.
- National Galvanizing Works, Versailles, Pa.
- Syracuse Tube Company, Syracuse, N. Y.
- Delaware Iron Company, New Castle, Del.
- Allison Manufacturing Company, Philadelphia, Pa.
- Cohoes Tube Works, Cohoes, N. Y.
- Ohio Tube Company, Warren, Ohio, and Norristown, Pa.
- American Tube and Iron Company, Middletown, Pa., and Youngstown, Ohio.
- Chester Pipe and Tube Company, Chester, Pa.
- Oil Well Supply Company, Pittsburg, Pa.
- * Western Tube Company, Kewanee, Ill.
- * Pittsburg Tube Company, Pittsburg, Pa.
- * Pennsylvania and Lake Erie Dock Company (7 per cent).

SHELBY STEEL TUBE COMPANY OF NEW JERSEY:

- * Shelby Steel Tube Company of Pennsylvania—
  - Shelby Steel Tube Company of Ohio—
    - *Garwood Seamless Tube Company, Garwood, N. J.*
    - Ellwood Weldless Tube Company, Ellwood City, Pa.
    - Greenville Tube Company, Greenville, Pa.
    - American Weldless Tube Company, Toledo, Ohio.
    - *Brewer Tube Company, Toledo, Ohio.*
    - *Mansfield Machine Works, Mansfield, Ohio.*
    - *United States Cold Drawn Steel Company, Cuyahoga Falls, Ohio.*
    - Shelby Steel Tube Company, Shelby, Ohio.
  - *Newcastle Tube Company, Newcastle, Pa.*
  - Albany Manufacturing Company, Albany, Ind.
  - Auburn Bolt and Nut Works, Auburn, Pa.
  - Pope Tube Company, Hartford, Conn.

- Crescent Sheet and Tin Plate Company, Cleveland, Ohio.
- Falcon Tin Plate and Sheet Company, Niles, Ohio.
- Beaver Tin Plate Company, Lisbon, Ohio.
- Irondale Steel and Iron Company, Middleton, Ind.
- La Belle Iron Works, Wheeling, W. Va.[6]
- Wallace, Banfield & Co., Irondale, Ohio.
- Aetna Standard Iron and Steel Company, Bridgeport, Ohio.[6]
- Atlanta Steel and Tin Plate Company, Atlanta, Ind.
- *Baltimore Tin Plate Company, Baltimore, Md.*
- *Blairsville Rolling Mill and Tin Plate Mill, Blairsville, Pa.*
- *Cincinnati Rolling Mill and Tin Plate Company, Cincinnati, Ohio.*
- Great Western Tin Plate Company, Joliet, Ill.
- Ellwood Tin Plate Company, Ellwood City, Pa.
- Johnstown Tin Plate Company, Johnstown, Pa.
- Laughlin Nail Company, Martins Ferry, Ohio.
- Morewood Company, Gas City, Ind.
- *Neshannock Sheet and Tin Plate Company, New Castle, Pa.*
- Ohio River Sheet and Tin Plate Company, Rochester, Pa.
- *Hamilton & Co., West Newton, Pa.*
- *Marshall Bros. & Co., Philadelphia, Pa.*
- Britton Rolling Mill Company, Clevelan
- Canonsburg Iron and Steel Company, burg, Pa.
- * National Mining Company (33⅓ per cent
- Morton Tin Plate Company, Cambridge.
- *Cumberland Steel and Tin Plate Compa berland, Md.*
- * Champion Iron and Steel Company, M Mich.
- Reeves Iron Company, Canal Dover, Ol

AMERICAN SHEET STEEL COMPAI

- Cambridge Iron and Steel Company, C Ohio.
- Cambridge Manufacturing Company, C Ohio.
- Canton Rolling Mill Company, Canton, Ohio.
- *Corning Steel Company, Hammond, Ind.*
- Dennison Rolling Mill Company, Dennison, Ohio.
- Dresden Iron and Steel Sheet Company, Dresden, Ohio.
- Falcon Iron and Nail Company, Niles, Ohio.
- *P. H. Laufman & Co., Ltd., Paulton, Pa.*
- Saltsburg Rolling Mill Company, Saltsburg, Pa.
- Midland Steel Company, Muncie, Ind.
- Old Meadow Rolling Mill Company, Scottdale, Pa.
- Piqua Rolling Mill Company, Piqua, Ohio.
- Cincinnati Corrugated Company, Piqua, Ohio.
- Struthers Iron and Steel Company, Struthers, Ohio.
- *Pittsburg Steel Manufacturing Company, Shousetown, Ohio.*
- *West Penn Sheet Steel Works, Leechburg, Pa.*
- Chester Rolling Mill Company, Chester, W. Va.
- Hyde Park Iron and Steel Company, Hyde Park, Pa.
- Kirkpatrick & Co., Ltd., Leechburg, Pa.
- Chartiers Iron and Steel Company, Carnegie, Pa.
- Scottdale Iron and Steel Company, Ltd., Scottdale, Pa.
- New Philadelphia Iron and Steel Company, New Philadelphia, Ohio.
- Reeves Iron Company, Canal Dover, Ohio.
- Aetna Standard Iron and Steel Company, Bridgeport, Ohio.[7]
- Apollo Iron and Steel Company, Apollo and Vandergrift, Pa.
  - * Apollo Gas Company.
- * W. Dewees Wood Company, McKeesport, Pa., and Wellsville, Ohio.
  - * Versailles Fuel Gas Company.
  - * McKeesport Terminal Railroad Company.
- *Coshocton Rolling Mill Company, Coshocton, Ohio.*

AMERICAN BRIDGE COMPANY:

- American Bridge Works, Chicago, Ill.
- Berlin Iron Bridge Company, East Berlin, Conn.
- Buffalo Bridge and Iron Works, Buffalo, N. Y.
- Carnegie Steel Company, Limited (Keystone Bridge Company, bridge and structural plant), Pittsburg, Pa.
- * Detroit Bridge and Iron Works, Detroit, Mich.
- Edge Moor Bridge Works, Wilmington, Del.
- Elmira Bridge Company, Elmira, N. Y.
- Gillette-Herzog Manufacturing Company, Minneapolis, Minn.
- Groton Bridge and Manufacturing Company, Groton, N. Y.
- Hilton Bridge Construction Company, Albany, N. Y.
- Horseheads Bridge Company, Horseheads, N. Y.
- * Koken Iron Works, St. Louis, Mo.
- LaFayette Bridge Company, La Fayette, Ind.
- Lassig Bridge and Iron Works, Chicago, Ill.
- Nelson & Buchanan Company, Chambersburg, Pa.[5]
- New Columbus Bridge Company, Columbus, Ohio.
- Pittsburg Bridge Company, Pittsburg, Pa.
- Post & McCord, Brooklyn, N. Y.
- Rochester Bridge and Iron Works, Rochester, N. Y.
- Schultz Bridge and Iron Company, Pittsburg, Pa.
- Shiffler Bridge Company, Pittsburg, Pa.
- Union Bridge Company, Athens, Pa.
- J. G. Wagner Company (bridge and structural plant), Milwaukee, Wis.
- Wrought Iron Bridge Company, Canton, Ohio.
- Youngstown Bridge Company, Youngstown, Ohio.
- * A. & P. Roberts Company, known as Pencoyd Bridge Works, Pencoyd, Pa.
- * Toledo Bridge Company, Toledo, Ohio.
- * Alabama Bridge and Iron Company, Decatur, Ala.
- * New Jersey Steel and Iron Company, Trenton, N. J.

III. MISCELLANEOUS.

LAKE SUPERIOR CONSOLIDATED IRON MINES:

Owning various important iron mines and properties in the Lake Superior region, controlling several hundred million tons of ore. Also owning the stock of Duluth, Missabe and Northern Railway Company.

BESSEMER STEAMSHIP COMPANY:

Owning a fleet of 25 steamers and 31 barges.

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* Indicates stock ownership in 1901.

† The other one-sixth interest in this concern was directly acquired by the Corporation.

[1] Organized by and in interest of Federal Steel Company. It may also be noted that, except as to the Illinois Steel Company's manufacturing plants, most of the various subsidiaries of the constituent concerns of the Federal Steel Company were directly organized by them and not acquired from other interests.

[2] Acquired blast furnaces and steel works only. Such a division of plants was made in several other instances.

[3] National Mining Company was promoted and organized in interest of National Steel Company, American Steel Hoop Company, and American Tin Plate Company.

[4] Promoted and organized in interest of American Steel and Wire Company of New Jersey after its organization.

[5] Acquired machinery and equipment only.

[6] Acquired tin-plate machinery and equipment only. A part of the property of this company was acquired by other constituent concerns.

[7] Acquired sheet-mill machinery and equipment only.

Section 15. Essential character of the Steel Corporation in 1901.

The character of the Steel Corporation as a consolidation of consolidations, as well as some idea of its magnitude, is brought out by the table facing this page.

The United States Steel Corporation, by including in its organization both of the first two groups of companies described, insured to itself on the one hand an abundant capacity for the production of crude steel and a large proportion of the country's output of heavy rolled products, and, on the other hand, secured control of several quasi-monopolistic concerns manufacturing particular lines of the more elaborated products, such as sheets, tin plate, tubes, and wire. The abundant steel-making capacity of the first group made it easy, of course, to supply all the steel required by this second group of concerns. Furthermore, while the companies in the first group taken together were very well fortified with reserves of raw materials, the acquisition of the Lake Superior Consolidated Iron Mines furnished an enormous additional supply and gave to the Corporation an exceptional degree of strength in this respect. It also contributed to the combination one of the most important railroads in the Lake ore region.

The position taken by the Steel Corporation is that this great aggregation of property was in the main an assembling and coordination of different branches in the industry, the primary object of which was to secure greater efficiency and integration, and, of course, the saving of the payment of profits to others. The Corporation contends that most of its constituent concerns were not in actual competition with one another, and it is disposed to minimize the restriction of competition brought about as a result of this great merger.

It is true that certain of the constituent consolidations, as, for instance, the American Steel and Wire Company and the National Tube Company, were not competing with one another at this particular period. However, there was active competition between the three principal crude-steel concerns—the Carnegie Company, the Federal Steel Company, and the National Steel Company—while these concerns, to some extent at least, were in competition with some of the large consolidations making the lighter finished products. Moreover, the fact should not be lost sight of that nearly all of the latter class of consolidations were originally created with the intention of restricting competition. A more important matter is that a period of violent competition among all of these concerns was imminent, as already described, and that the United States Steel Corporation was organized for the specific purpose of preventing the new competition thus threatened as well as eliminating that already existing among these concerns. The opportunity for reaping a huge promoter's profit out of this situation undoubtedly was an important consideration in bringing about the merger. Nevertheless the primary object was the restriction or prevention of competition.

The argument that this merger permitted increased efficiency through greater integration and coordination undoubtedly has some force. In particular there is no doubt that the integration with the manufacturing plants of all these consolidations of such extensive resources of raw materials as the ore properties of the Lake Superior Consolidated and Minnesota Iron (Federal) companies, and the coke properties of the Frick (Carnegie) company, not to mention others, was of great advantage from a commercial standpoint, i. e., in saving the payment of profits to others. In the same way, the inclusion of some of the most important ore-carrying railroads both at the head of the Lakes and between Lake Erie and Pittsburg, as well as the great ore fleets on the Lakes, meant that the profits earned on such transportation would come to the consolidated company. The control of these ore roads also would result in giving the Steel Corporation a great advantage over other producers who were compelled to use them. There is no doubt also that the bringing together of so many great manufacturing properties under one control opened up possibilities of a more economical subdivision of the business whereby particular plants could concentrate work on particular kinds of rolled products, and whereby the distinctly inferior plants could be dismantled or at least shut down and used only when the demand was unusually great. So far, however, as the integration of manufacturing processes themselves were concerned, the advantages of such a system were probably about as fully realized by the larger and better equipped plants of some of the constituent concerns. At any rate, little gain in this respect could be expected from merely bringing the several plants under a single control. On the other hand, there would be a real economy possible in dividing the work so that the products sold would be made at the plants which were nearest to the markets to be supplied. For example, the structural or merchant steel requirements of the western markets could be more economically supplied from the works of the Federal Steel Company, while the Carnegie Company would be better situated to supply the eastern markets and the export trade. Such arrangements already existed to some extent in the case of some of the constituent concerns.

These possible economies of consolidation, however, probably were a subordinate consideration in the formation of the Steel Corporation except those of a commercial character, i. e., those that did away with the necessity of paying a profit to somebody else on the raw materials or transportation of raw materials. The possibilities of real manufacturing economies could be but slowly realized in most cases, and, as already stated, the controlling motive in the organization of the company was to avert the competitive struggle then threatened. Meanwhile, however, the argument of economy and increased earning power was used to justify the formation of the combination, and also to facilitate the flotation of its securities.

The crude-steel (ingot) capacity of the Corporation at its organization was fully 9,400,000 tons, this representing substantially 66 per cent of the total for the country, while its capacity for the various finished products which it manufactured was approximately 7,700,000 tons, this representing about 50 per cent of the total of the country for these lines. In certain products, however, the Corporation's percentage approached a complete monopoly. Its larger percentage of crude than of finished steel is explained by the fact that some of the principal steel-making concerns did not have finishing mills for more than a portion of their output.

Roughly speaking, it may be said that the Corporation at its organization secured control of three-fifths of the steel business of the country. Its proportion of the pig-iron business was somewhat smaller, about 44 per cent, its actual capacity of this product being about 7,400,000 tons. These figures, however, do not fairly state the position of the Corporation, because of the large production by outsiders of foundry pig iron and certain special kinds of pig iron which really did not involve competition with the Corporation. The Corporation's share of the production of pig iron for strictly steel-making purposes was probably not less than 58 per cent.

The Corporation had hundreds of millions of tons of desirable Lake ore in reserves, over 50,000 acres of the choicest coking-coal lands, over 1,000 miles of railroad, exclusive of subsidiary trackage, a fleet of 112 Lake steamers and barges, not to mention large investments in docks, natural-gas and limestone properties, and other kindred branches of the industry.

Despite its enormous size the United States Steel Corporation did not secure a monopoly of the iron and steel industry as a whole, although its position in several branches was monopolistic (that is, tending toward monopoly). In the case of a few products, such as tin plate, sheets, wire, and nails, its control was at first very nearly complete, but in other branches of the industry it had a number of important rivals from the start. Thus, it will be seen that the Corporation did not include such concerns as the Pennsylvania Steel Company, the Cambria Steel Company, the Lackawanna Iron and Steel Company, Jones & Laughlins (Ltd.), the Bethlehem Steel Company, the Republic Iron and Steel Company, and the Colorado Fuel and Iron Company, not to mention several others of magnitude. At the start, moreover, the Corporation did not acquire the Tennessee Coal, Iron and Railroad Company, that concern not being taken over until 1907.

Several of these outside concerns were at that time engaged in the manufacture of special products which did not bring them into sharp conflict with the Corporation, or confined their activities to a more limited field than that of the Corporation. The failure of the Corporation to include such concerns was, therefore, less significant than might at first sight appear. However, several of the companies remaining outside, notably the Jones & Laughlin interests, the Lackawanna Iron and Steel Company (see p. 96), the Republic Iron and Steel Company, the Pennsylvania Steel Company, and the Cambria Steel Company, were important rivals of the Corporation. The Colorado Fuel and Iron Company in the West on account of its geographical location, was not a serious rival. Nevertheless, negotiations were entered into shortly after the organization of the Steel Corporation for the acquisition of that concern, but were not consummated. The Tennessee Coal, Iron and Railroad Company in the South was at this time chiefly concerned with the production of foundry pig iron.

The consolidation movement in the steel industry reached a climax in the organization of the Steel Corporation. Some other important mergers of iron and steel properties were subsequently effected; most of these, however, were of concerns engaged in the manufacture of machinery and highly elaborated iron and steel products, rather than in those cruder and simpler steel products which were chiefly turned out by the concerns already discussed in this chapter, and none of them compared in size with the Steel Corporation.

The Corporation itself, moreover, made several further important acquisitions aside from that of the Tennessee Coal, Iron and Railroad Company. These are referred to in detail in Chapter V.

CHAPTER II.

ANALYSIS OF INVESTMENT OF CONSTITUENT COMPANIES OF UNITED STATES STEEL CORPORATION.

Section 1. Importance of determining actual investment as distinguished from book valuations of assets.

As already stated, an important feature of the Bureau's investigation of the steel industry is a discussion of the relation between investment and capitalization. Such a study is important because of its direct bearing upon the reasonableness of prices and profits. Owing to the fact that the consolidation movement in the steel industry was accompanied by a great inflation of security issues, a comparison of profits with capitalization as a rule does not show the true rate of profit. Instead, it is necessary to determine approximately the actual investment value of the properties represented by such capitalization.

It may be noted at this point that the Bureau has not attempted to lay down principles as to the proper basis of capitalization. Opinions as to the proper basis of capitalizing an industrial concern are extremely diverse. One of the most common theories is that capitalization should represent only the actual cash investment in the property of a corporation. Another theory assumes the cost of reproduction of plants and other assets, and not the original cash investment, as the proper basis. Another view largely ignores both the preceding considerations, and holds that capitalization should be chiefly determined by earning power; that is, that the amount of securities should be that on which the anticipated earnings will yield at least a certain rate of profit, this rate varying with different industries and even with different corporations in the same industry, and depending largely, of course, upon the personal views of the organizers. Generally speaking, this capitalization on the basis of earning power has been the one followed in the organization of the great industrial corporations of the present time, in so far as any definite theory has prevailed at all. Still another theory is that the capitalization of a corporation should be so adjusted and readjusted that its securities will sell substantially at par.

It is not intended in this report to pass upon the merits of these conflicting views. Obviously, the significance of the word "overcapitalization" depends largely upon which of them is accepted as the correct standard. Instead of passing upon such a controverted point, the discussion in this report has been concerned with a presentation of facts in order to show the relationship between capitalization and the investment represented thereby, and particularly the relationship between the investment in tangible property values and the securities issued. The value of intangible items such as good will, "merger value," and similar considerations is not denied, but, instead of attempting to measure such values, as a rule this report simply points out their existence. It may be noted, however, that such intangible considerations as good will appear to be of relatively less importance in the steel industry than in many other industries where brand values, trade-marks, and similar factors play an important part.

While not attempting to lay down rules as to capitalization, the report does not hesitate, in some cases, to characterize the issuance of securities as involving overcapitalization, since the evidence at times is conclusive that, judged by any standard, the issue was excessive. (See also p. 325.)

In the following discussion the word "capitalization" is used to represent the total par value of the stocks and bonds directly issued by a given company, including, unless otherwise indicated, the bonds of underlying companies. Issues of debentures are regarded as similar to issues of bonds, and the same is true of certain temporary indebtedness, such as purchase-money obligations and sundry real-estate mortgages, which in most cases appear to have been issued for fixed property. Ordinary bills and accounts payable, of course, are not considered as coming within the term capitalization.

Section 2. Comparison of total securities issued by Steel Corporation with total securities and cash acquired by it.

For the companies acquired at its organization and shortly thereafter, in 1901,[1] plus $25,003,000 cash capital, together with underwriting services (see p. 243), the United States Steel Corporation issued the following securities:

Preferred stock	$510, 205, 743
Common stock	508, 227, 394
Bonds	303, 450, 000
Total	1, 321, 883, 137
Add:	
Underlying bonds of constituent companies[2]	59, 091, 657
Mortgages and purchase money obligations[3]	21, 872, 023
Grand total	1, 402, 846, 817

The total of the securities directly issued by the United States Steel Corporation ($1,321,883,137) was very greatly in excess of the total securities of the constituent companies thereby acquired. The terms on which the securities of these constituent concerns were exchanged and the total amounts of United States Steel securities issued in such exchange are given in the following table:

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[1] Including the American Bridge Company, the Lake Superior Consolidated Iron Mines, the Bessemer Steamship Company, and the Shelby Steel Tube Company. The additional securities acquired during 1901 by exchange of stock consisted of scattered shares of companies, the bulk of whose stocks had already been purchased.

[2] Including $41,844 scrip of the Illinois Steel Company.

[3] Includes $8,500,000 issued for the Bessemer Steamship Company after the formation of the Steel Corporation.

TABLE 4.—COMPARISON OF SECURITIES ISSUED BY UNITED STATES STEEL CORPORATION IN 1901 WITH AMOUNTS OF SECURITIES OF CONSTITUENT CONCERNS AND CASH ACQUIRED THEREFOR.

Company.	Securities and cash acquired.[1]	United States Steel stock issued for each $100 old stock.		Amount United States Steel securities issued in exchange.			
		Preferred.	Common.	Bonds.	Preferred stock.	Common stock.	Total.
Carnegie Company:							
Bonds	[2]$159,450,000	(3)	(3)	$159,450,000			
Stock (all common)	160,000,000			144,000,000	$98,277,120	$90,279,040	$492,006,160
Federal Steel Company:							
Preferred stock	53,260,200	$110.00			58,586,220		
Common stock	46,483,700	4.00	$107.50		1,859,348	49,969,978	110,415,546
National Tube Company:							
Preferred stock	39,997,400	125.00			49,996,750		
Common stock	39,937,400	8.80	125.00		3,514,491	49,921,750	103,432,991
American Steel and Wire Company of New Jersey:							
Preferred stock	39,998,500	117.50			46,998,237		
Common stock	49,901,900		102.50			51,149,448	98,147,685
National Steel Company:							
Preferred stock	26,992,200	125.00			33,740,250		
Common stock	31,969,800		125.00			39,962,250	73,702,500
American Tin Plate Company:							
Preferred stock	18,325,000	125.00			22,906,250		
Common stock	27,995,000	20.00	125.00		5,599,000	34,993,750	63,499,000
American Steel Hoop Company:							
Preferred stock	13,997,500	100.00			13,997,500		
Common stock	18,995,000		100.00			18,995,000	32,992,500
American Sheet Steel Company:							
Preferred stock	24,497,700	100.00			24,497,700		
Common stock	24,498,800		100.00			24,498,800	48,996,500

[1] Includes scattered shares purchased from April to December, 1901. Up to the close of 1901 the following stocks of subsidiary companies had not been acquired:

Company.	Preferred stock.	Common stock.	Company.	Preferred stock.	Common stock.
Federal Steel Company	$700	$600	Lake Superior Consolidated Iron Mines		$10,689
American Steel and Wire Company	1,000	18,600	Subsidiary stocks		91,218
National Steel Company	4,000	30,000	Shelby Steel Tube Company	$223,900	133,300
American Sheet Steel Company	400	400	Total	246,200	289,207
American Bridge Company	16,200	4,400			

Some of these stocks were acquired later.

[2] The remaining $550,000 of Carnegie bonds are included under the item of underlying bonds of subsidiary companies.

[3] See note 2, page 174.

TABLE 4.—COMPARISON OF SECURITIES ISSUED BY UNITED STATES STEEL CORPORATION IN 1901 WITH AMOUNTS OF SECURITIES OF CONSTITUENT CONCERNS AND CASH ACQUIRED THEREFOR—Continued.

Company.	Securities and cash acquired.	United States Steel stock issued for each $100 old stock.		Amount United States Steel securities issued in exchange.			
		Preferred.	Common.	Bonds.	Preferred stock.	Common stock.	Total.
American Bridge Company:							
Preferred stock	$31,348,000	$110.00			$34,482,800		
Common stock	30,946,400		$105.00			$32,493,720	$66,976,520
Lake Superior Consolidated Iron Mines: Common stock	29,413,905	135.00	135.00		39,708,771	39,708,771	79,417,542
Oliver Iron Mining and Pittsburg S. S. companies (one-sixth interest)	421,700				9,250,000	9,250,000	18,500,000
Shelby Steel Tube Company:							
Preferred stock	4,776,100	37.50			1,791,038		
Common stock	8,018,200		25.00			2,004,550	3,795,588
Total securities acquired by direct exchange[1]	[2] 881,224,405			$303,450,000	445,205,475	443,227,057	1,191,882,532
United States Steel stocks issued to syndicate for $174,000 par value of stocks acquired otherwise than by direct exchange and for $25,000,000 cash capital and underwriting services	174,000 25,000,000				64,998,768	64,998,837	129,997,605
Stock sold to incorporators for cash	3,000				1,500	1,500	3,000
Total	906,401,405			303,450,000	510,205,743	508,227,394	1,321,883,137
Underlying bonds of constituent companies							59,091,657
Mortgages and purchase money obligations of constituent companies							[3] 21,872,023
Grand total securities issued and assumed							1,402,846,817

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[1] The following securities of several of the companies were acquired otherwise than by direct exchange, as explained in the text:

National Tube Company:	
Preferred	$2,600
Common	62,600
American Steel and Wire Company of New Jersey:	
Preferred	500
Common	79,500
National Steel Company:	
Preferred	3,800
Common	200
American Tin Plate Company: Common	$5,000
American Steel Hoop Company:	
Preferred	2,500
Common	5,000
American Sheet Steel Company:	
Preferred	1,900
Common	800
American Bridge Company: Preferred	9,600
	174,000

[2] See note 1 on page 113.

[3] Includes $8,500,000 purchase-money obligations issued for the Bessemer Steamship Company.

It will be noted that the stock of the Bessemer Steamship Company was acquired through the issue of purchase-money obligations, these being issued by the Pittsburg Steamship Company, a subsidiary concern. A cash price of $8,500,000 was named on this property, and while it might be considered that the working capital of the Corporation was reduced by that amount, as already stated, such purchase-money obligations have not been treated by the Bureau as ordinary current liabilities. Until their redemption, which was not commenced until November, 1902, the actual working capital of the Corporation was not reduced on account of this acquisition.

It will be seen, therefore, that the organization of the United States Steel Corporation resulted in an increase of capitalization over that of its constituent concerns (not considering underlying bonds, scrip, purchase-money obligations, etc.) from $881,398,405[1] to $1,321,883,137, or of $440,484,732; after deducting $25,003,000 new cash capital, there was a net increase of $415,481,732, or 47 per cent.

It is worth calling attention to the fact that no less than $144,000.000 of this increase in capitalization was in the form of bonds. The total preferred-stock issue of the new company, namely, $510.205,743, compares with an aggregate of $253,213,500 for the preferred issues of the subsidiary concerns, an increase of $256,992,243. Its total issue of common stock, $508,227,394, compares with an aggregate of $468,734,905 for the subsidiaries, an increase of $39,492,489.

A part of the increase in capitalization, as just noted, was covered by the $25,003,000 new cash capital provided.

Section 3. Methods of determining the investment of the Steel Corporation.

As the first step in an analysis of the investment of the United States Steel Corporation it is desirable to present a statement of the value (reduced to a cash basis) of the physical property acquired by the company at the time of its organization in 1901. Such a valuation, so far as the Steel Corporation is concerned, may be regarded as the approximate equivalent of its investment in such property at that time. Having done this, the subsequent additions to the Corporation's investment can be determined from its official reports and additional data obtained directly from the Corporation.

The establishment of the value of the physical properties of the Corporation at its organization in 1901 is a difficult task. Obviously a valuation or appraisal of the physical properties of the Corporation as they existed on that date is now impossible. No such appraisal, nor even a detailed estimate, appears to have been made at the time the company was organized. Owing to the great importance of determining upon a valuation which shall be fair and yet at the same time not distorted because of the great inflation of securities issued, the Bureau has made its analysis by three different methods—first, by historical study of the organization and investment of the constituent concerns at the time of their formation; second, by computation of the public estimate of the value of the properties of these constituent concerns as reflected in the market prices of their securities; third, by a more detailed estimate of the value of the physical properties of the Corporation by departments of its business, computed from all available data, and with an especially elaborate calculation of the value of the ore property.

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[1] This includes $174,000 stock in constituent companies acquired otherwise than by direct exchange.

The United States Steel Corporation and several of its constituent companies discussed in the following pages were holding companies, either wholly or in part, so that, strictly speaking, their property to this extent consisted of securities held in their treasuries. For the sake of clearness and convenience, however, this technical consideration will be disregarded and the property of such holding companies considered as the property covered by the securities thus owned.

The Bureau's analysis, based upon historical study of the organization and investment of the constituent concerns of the Steel Corporation, is presented in this chapter. In general the evidence shows that in the organization of the principal constituent concerns of the Steel Corporation preferred stock was issued up to the full amount of the physical assets, at least, and in many cases up to the full value of the properties acquired, including intangible considerations as well, so that the common stock was nothing more than a mere bonus. The common stock of the Federal Steel Company, however, had some tangible assets back of it. In the case of the most important constituent concern, the Carnegie Company, there was no preferred stock, but instead a large issue of bonds. For this concern the evidence on the whole tends to show that bonds were issued substantially up to the full amount of the physical assets acquired and that the stock was issued merely against good will and other intangible considerations.

Such analysis of the investment in the constituent companies of the Steel Corporation at the dates of their respective organizations does not, of course, fairly represent the value of such investment in April, 1901, when these concerns were acquired by the Steel Corporation. The accumulated surplus earnings of these concerns during the intervening period are, however, available, and by combining these and capital otherwise obtained with the Bureau's estimate of the original investment there is obtained what is approximately the investment of these concerns at the time the Steel Corporation was formed. (See p. 167.)

After analyzing the investment of the constituent concerns in this manner, the second method above noted is taken up, namely, the computation of the market prices of the securities of these constituent companies. The more elaborate analysis by the third method is presented in Chapter III, while in Chapter IV the evidence obtained by all these methods is summarized, together with some further data bearing upon the problem.

No one of these methods of analysis can be regarded as precise or absolutely conclusive, but the study of the investment in the property of the Corporation from these three different points of view gives a basis for a fair and approximately correct estimate of that value. In any event, the methods followed in this report afford by far the best criterion for judging the investment in these properties that can be presented so long after the company was formed.

There will first be taken up the historical analysis of the organization of the principal constituent concerns. It will be found convenient to discuss these companies in the following order:

Federal Steel Company.
American Steel and Wire Company.
American Tin Plate Company.
National Steel Company.
American Steel Hoop Company.
American Sheet Steel Company.
National Tube Company.
Shelby Steel Tube Company.
American Bridge Company.
Lake Superior Consolidated Iron Mines.
Bessemer Steamship Company.
Carnegie Company.

Section 4. Federal Steel Company.

The Federal Steel Company at its organization in September, 1898, issued $53,260,900 of 6 per cent noncumulative preferred stock and $46,484,300 of common stock, a total of $99,745,200. The authorized amounts were $100,000,000 of each class. It acquired therefor the stocks of the Illinois Steel Company, the Minnesota Iron Company, the Elgin, Joliet and Eastern Railway Company, the Lorain Steel Company of Ohio (a majority interest), and the Johnson Company of Pennsylvania,[1] aggregating $49,168,435, together with a net sum of $11,692,221 cash.[2] The various stocks were acquired subject to bonded indebtedness aggregating $30,217,179. The transaction is summarized in the following table:

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[1] This covered stocks of certain subsidiaries of that concern.

[2] The organization agreement provided for the raising of $14,075,000 cash, but a portion of this was used in part payment of the Lorain Steel Company, as indicated in the table. The net amount of cash, as stated above, may not allow for expenses of organization.

TABLE 5.—COMPARISON OF STOCK ISSUED BY FEDERAL STEEL COMPANY WITH SECURITIES AND CASH ACQUIRED AT ITS ORGANIZATION IN SEPTEMBER, 1898.

Federal Steel securities issued:		
Preferred stock, 6 per cent noncumulative		$53,260,900
Common stock		46,484,300
Total		99,745,200
Securities and cash acquired:		
Stock—		
Illinois Steel Company	$18,650,635	
Minnesota Iron Company	16,500,000	
Elgin, Joliet and Eastern Railway Company	6,000,000	
Lorain Steel Company of Ohio	[1] 5,017,800	
Johnson Company of Pennsylvania	3,000,000	49,168,435
Cash—		
Syndicate arrangement	14,075,000	
Lorain-Johnson purchase [2]	264,455	
Total	14,339,455	
Less cash paid in connection with Lorain-Johnson purchase	2,647,231	
Net cash		11,692,224
Total securities (par value) and cash acquired		[3] 60,860,659
Excess of securities issued over securities and new cash acquired		38,884,541

There can be no doubt that the large amount of stock issued by the Federal Steel Company considerably exceeded a fair market valuation of the property back of the stocks acquired, plus the new cash capital provided, after allowing for the bonded indebtedness.

The Federal Steel Company offered to issue its preferred stock for the shares of three of the constituent companies on the following terms: Illinois Steel Company, 1 share for each share of old stock; Minnesota Iron Company, 1.355 shares for each share of old stock; Elgin, Joliet and Eastern Railway Company, 0.875 share for each share of old stock.

The company also agreed to deliver to the underwriting syndicate in return for $14,075,000 of cash and the services of the syndicate $5,680,565 par value of its preferred stock and $45,426,500 par value of its common stock. It was stipulated, however, in the underwriting

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[1] The Federal Steel Company subsequently acquired the remaining $3,982,200 stock of the Lorain Steel Company at par, thereby reducing its working capital to that extent, but the above is a correct statement of the transaction at the time.

[2] See page 124.

[3] These various stocks were acquired subject to bonded indebtedness of $30,217,179, as follows:

Illinois Steel Company	$13,285,123
Southwest Connellsville Coke Company	173,056
Minnesota Iron Company (underlying bonds)	7,742,000
Elgin, Joliet and Eastern Railway Company	7,417,000
Lorain Steel Company (underlying bonds)	1,600,000
Total	30,217,179

agreement that the syndicate should offer to the stockholders of the constituent companies an alternative proposition by which, on deposit of certain sums in cash, these stockholders would receive, in addition to the respective amounts of preferred stock above stated, a certain amount in common stock of the company, the cash so raised, of course, relieving the syndicate to that extent of the necessity of providing the stipulated amount of $14,075,000. The arrangement, so far as these three principal companies were concerned, worked out as follows:[1]

TABLE 6.—AMOUNTS OF FEDERAL STEEL STOCKS DELIVERED BY UNDERWRITING SYNDICATE IN EXCHANGE FOR STOCKS IN ACQUIRED COMPANIES, AND CASH SECURED IN CONNECTION WITH THIS EXCHANGE.[2]

Constituent company.	Deposited.			Received in Federal Steel stocks.			
	Old stock, par value.	Cash.		Preferred.		Common.	
		Amount per share.	Total.	Amount per share.	Total.	Amount per share.	Total.
Illinois Steel Company....	$18,650,635	$20.00	$3,730,127	$100.00	$18,650,635	$80.00	$14,920,508
Minnesota Iron Company.	16,500,000	27.10	4,471,500	135.50	22,357,500	108.40	17,886,000
Elgin, Joliet and Eastern Railway................	6,000,000	17.50	1,050,000	87.50	5,250,000	70.00	4,200,000
Total..............	41,150,635	....	9,251,627	....	46,258,135	....	37,006,508

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[1] The calculation here given is on the assumption that all of the underlying stocks were exchanged. There were a few shares of some of these underlying stocks which were not deposited under this offer within the time limit originally set, and it is possible that when these were subsequently acquired no cash was obtained. The facts could not be definitely ascertained and the amount of such delinquent stock is so small that this consideration may be ignored. (See also p. 126.)

[2] The arrangement offered by the underwriting syndicate is shown below:

Constituent company.	On deposit of—		Received Federal Steel stocks.	
	Old stock, par value.	Required cash payment.	Preferred.	Common.
Illinois Steel Company..................................	$100	$20.00	$100.00	$80.00
Minnesota Iron Company................................	100	27.10	135.50	108.40
Elgin, Joliet and Eastern Railway........................	100	17.50	87.50	70.00

It is worth noting that if Federal Steel preferred stock had been considered worth $80 in cash the prices in that stock for the constituent stocks given on page 118 would suggest a cash value of these as follows: Minnesota Iron, $108.40; Illinois Steel, $80; Elgin, Joliet and Eastern Railway, $70. If from the amounts of preferred stock received by stockholders of these concerns as stated here there be deducted the amounts subscribed for in cash, it will be seen that the remaining amounts of preferred would be identical in each case with the amounts of common, and moreover identical with the indicated cash values just given. These facts suggest the possibility that $100 in preferred and $100 in common stock of the Federal Steel Company was given for each $100 of appraised cash value of the acquired stocks, the remaining preferred stock of the Federal Steel Company being issued in each case for cash at par.

Illinois Steel Company.—For the $18,650,635 stock of the Illinois Steel Company, plus $3,730,127 in cash, therefore, the Federal Steel Company issued $18,650,635 of its preferred and $14,920,508 of its common stock, a total of $33,571,143. The cash value of the equity, in excess of bond indebtedness, in the property represented by this Illinois Steel stock unquestionably was much less. The Illinois Steel Company, which was organized in 1889, was itself a consolidation of three concerns—the North Chicago Rolling Mill Company (with plants at North Chicago, South Chicago, and Milwaukee), the Union Steel Company, and certain property of the Joliet Steel Company, against which the Illinois Steel Company originally issued $17,622,000 of its stock.[1]

The capital stock was subsequently increased to $18,650,635. In addition the Illinois Steel Company had outstanding at the time of the transfer to the Federal Steel Company $13,200,000 bonds and $85,142.67 in scrip.

At this late date it is practically impossible to say how far the stock of the Illinois Steel Company was covered by actual value. The valuation placed upon the plants by the officers of the three constituent concerns at the organization of that company, for purposes of consolidation, was $12,750,000, or about $5,000,000 less than the amount of the stock issued by the new concern.[2] In view of the usual tendency to inflate valuations in such mergers, it seems altogether probable that these plant valuations were liberal. The difference between these valuations and the total issue of stock of the new concern may have been covered by working capital.

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[1] The amounts of the Illinois Steel Company's stock issued for the constituent concerns were given in the 1897 Investors Supplement of the Economist (Chicago) as follows, the rates of exchange being obtained from the consolidation agreement:

Company.	Capital stock of old company at time of merger.	Each $100 of old stock, received in Illinois Steel stock.	Illinois Steel stock issued in order to make the exchange.
North Chicago Rolling Mill Company	$6,000,000	$158.50	$9,510,000
Union Steel Company:			
Preferred	3,000,000	105.00	3,486,000
Common	1,600,000	21.00	
Joliet Steel Company	See below.		4,626,000
Total			17,622,000

The Illinois Steel Company did not acquire the capital stock of the Joliet Steel Company, but instead the manufacturing plant of the latter at Joliet and possibly some of its detached property. The Joliet Steel Company subsequently went into liquidation and distributed to its stockholders the Illinois Steel Company stock received in this manner as well as its remaining assets. The authorized capital stock of the Joliet Steel Company at this time was $3,000,000; the amount outstanding apparently was about $2,900,000.

[2] This total was allotted as follows:

Plant of the North Chicago Rolling Mill Company	$7,000,000
Plant of the Union Steel Company	2,750,000
Plant of the Joliet Steel Company	3,000,000
Total	12,750,000

A condensed balance sheet of the Illinois Steel Company on June 30, 1898, gave the value of the plants, with real estate and improvements, at $20,194,096, and the total book value of the stock (after allowing for bonded indebtedness) at $19,315,542; that is, the capital stock, $18,650,635, and the surplus, $664,907. A condensed statement of the property follows:

Plant	$20,405,468
Less reserve for replacements, etc	211,372
Plant, net	20,194,096
Permanent investments	7,021,650
Working capital (net)	5,384,939
Total net assets	32,600,685
Bonds and scrip	13,285,143
Book value of stock	19,315,542

There is good reason for regarding this book valuation of the stock at this time as sufficiently high. Including the bonds, the indicated book value of the investment was approximately $32,500,000, which was sufficient to cover a very extensive investment in iron and steel properties.

That the company was liberally capitalized, moreover, is indicated by the earnings, which from the date of its organization, in May, 1889, to December 31, 1897, averaged only 3.8 per cent on the capital stock, as follows:

TABLE 7.—SUMMARY OF EARNINGS OF ILLINOIS STEEL COMPANY, 1889–1897.

Year.	Net earnings, after interest on bonds and depreciation charges.	Dividends.	Annual surplus.	Total surplus.
1889[1]	$798,741	$703,400	$95,341	$95,341
1890	2,261,095	1,425,918	835,177	930,518
1891	1,038,777		1,038,777	1,969,295
1892	2,019,268	[2] 3,452,232	[3] 1,432,964	536,331
1893	[4] 885,803		[3] 885,803	[3] 349,472
1894	30,607		30,607	[3] 318,865
1895	1,233,266		1,233,266	914,401
1896	[3] 704,281	559,519	[3] 1,263,800	[3] 349,399
1897	370,025		370,025	20,626
Total	6,161,695	6,141,069	20,626	20,626

Average annual net earnings, after interest on bonds and depreciation, 8⅔ years	$710,965
Equal on issued stock of $18,650,635[5] to ... per cent per annum	3.8
Average annual net earnings, May, 1889, to December, 1892, 3⅔ years	$1,668,513
Average rate, 1889–1892, only ... per cent per annum	8.9

[1] Eight months.

[2] These dividends, which include the scrip dividend of 13.51 per cent, or $2,519,700, and a cash dividend of 5 per cent, or $932,532, were not paid until 1893.

[3] Deficit.

[4] Deficit. After allowing for depreciation (chiefly on ore) of $1,467,371.

[5] During a small portion of this period the amount of stock issued was somewhat less, but not enough to materially affect the average rate as here stated.

While there is, of course, no rigid relationship between earnings and property values, it must be admitted that average earnings of less than 4 per cent by a large steel company over a period of more than eight years do not indicate a high value for the stock. It is true that during the latter part of the period covered the iron industry was very badly depressed in sympathy with the commercial panic which affected all business at that time. From 1889 to 1892, however, the steel industry was distinctly prosperous. An average rate of earnings of only 8.9 per cent for this particular period, therefore, indicates that the capitalization of the Illinois Steel Company at least did not understate the investment.

This conclusion is further supported by the prices of the company's stock, which from 1895 to the middle of 1898 (or just prior to the transfer of the company to the Federal Steel Company) ruled at considerably below par, and frequently at much less than half the par value. The highest and lowest prices of stock, yearly, for this period were as follows:

Year.	Highest.	Lowest.	Year.	Highest.	Lowest.
1895	82½	59	1897	50	29½
1896	75	33	1898 (January to July)	60	44½

In the latter part of 1898 the price of the stock rose sharply, but this was undoubtedly due to the pending organization of the Federal Steel Company.

So far as the available evidence goes, therefore, it suggests that the maximum valuation which can be placed upon the stock of the Illinois Steel Company would be the book valuation above given, namely, $19,315,542, or after an adjustment for the accounts of certain subsidiaries, $19,238,149. Indeed, such valuation seems unduly liberal. Using this figure, however, and adding to it the $3,730,127 in cash acquired therewith (see Table 6) gives a total consideration of $22,968,276, against which the Federal Steel Company, as above shown, issued $33,571,143 of its stock ($18,650,635 preferred and $14,920,508 common). This, of course, is over and above the bonded indebtedness.

Minnesota Iron Company.—For the $16,500,000 stock of this concern, plus $4,471,500 cash, the Federal Steel Company (see Table 6) issued $22,357,500 of its preferred and $17,886,000 of its common stock, or a total of $40,243,500.

It is exceedingly difficult to estimate the value of the Minnesota Iron Company. It included extensive ore property, improved and unimproved, a fleet of 9 ore steamers and 7 barges, also $3,000,000 capital stock of the Duluth and Iron Range Railroad, a very profitable concern, together with some miscellaneous securities and quick assets. The consolidated balance sheet of the company for June 30, 1898, the date as of which the Federal Steel Company acquired this concern, showed a surplus of $6,436,134, which, added to the capital stock of $16,500,000, gives a total book value of $22,936,134; the company had no bonded debt, but there were $7,742,000 underlying bonds.

While there can be little doubt that the actual investment in the property was considerably less than the book value, it is difficult to say how far the book value may have differed from a fair current valuation of the property at the time the Federal Steel Company was organized. The ore property of the company had enhanced in value somewhat, while the extent of the ore reserves later proved to be considerably greater than the original estimates. The value of the company's investment in the Duluth and Iron Range Railroad, which had a substantial monopoly of the ore business in a limited section of the Lake region and which earned large profits (an average of nearly 20 per cent on the $3,000,000 capital stock from 1894 to 1898), is also difficult to estimate.

The earnings of the Minnesota Iron Company for the three years ended April 30, 1893 (later figures are not available), were equivalent to 8¼ per cent on the $16,500,000 of stock outstanding. As these, on the whole, were distinctly prosperous years, this average rate does not indicate a valuation of the property in excess of the stock plus the accumulated surplus. The market valuation of the stock of the company during this period ranged from about $65 to $90 per share, or considerably less than par value, while from 1894 to July, 1898, the stock never sold as high as $80 and frequently sold below $50, and occasionally below $40, per share; in the latter part of 1898 it rose sharply to about par, but this price was in anticipation of the organization of the Federal Steel Company and can not be used as an indication of the value of the property.[1]

Therefore, as in the case of the Illinois Steel Company, so far as the available evidence indicates, there is reason to believe that the real value of the property did not exceed the book value, i. e., the capital stock plus the surplus, as shown by the consolidated balance sheet.

Elgin, Joliet and Eastern Railway Company.—The stock of the Elgin, Joliet and Eastern Railway Company, as above noted, was valued for consolidation purposes at $87.50 per share in Federal Steel preferred stock, this being equivalent at the current market price of

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[1] The range of quotations yearly from 1890 to 1898 was as follows:

1890	80 –91
1891	68 –84
1892	63½–82
1893	60 –69½
1894	40 –52
1895	39–72
1896	40–72
1897	38–60
1898	57–99¾

the latter (see p. 125) to less than $70 in cash. The average earnings for the three years ended June 30, 1898, after deducting all fixed charges, were equivalent to only about 1.3 per cent annually on the $6,000,000 of capital stock. The company at the time of the transfer had outstanding about $7,417,000 of bonds. This large indebtedness, taken in connection with the moderate earnings above shown (even allowing for the fact that they were for years of depression), leaves little doubt that a valuation of $70 per share for the stock is not only liberal, but probably excessive. On this basis its value would be $4,200,000, whereas for this stock, plus $1,050,000 in cash, the Federal Steel Company issued $9,450,000 of its securities.

LORAIN STEEL COMPANY PROPERTIES.—For $5,017,800 stock of the Lorain Steel Company of Ohio, and $3,000,000 stock of the Johnson Company of Pennsylvania (this covering the stocks of several subsidiary companies), the Federal Steel Company issued $1,322,200 of its preferred stock, and $1,054,800 of its common stock, together with a cash payment of $2,647,231. It received with these properties $264,455 in cash, which may be considered as reducing the net cash payment to that extent. The total consideration, taking the Federal Steel stocks issued at their par value, would be $4,759,776. A better basis,[1] however, is to take these stocks at the average market prices at which they sold during the first few months after the organization of the Federal Steel Company. (See p. 125.) This would reduce the net total consideration to approximately $4,068,000. As a matter of fact, the original cost of these Lorain properties as stated to the Bureau by the Steel Corporation, was almost exactly $4,000,000. Subsequently, the balance of the stock of the Lorain Steel Company was acquired at par.

SUMMARY.—Accepting the book valuations of the Illinois Steel and the Minnesota Iron companies' stocks, and a valuation of $70 per share for the stock of the Elgin, Joliet and Eastern Railway Company, and allowing $4,000,000 for the Lorain and Johnson concerns, the total indicated value of the property acquired by the Federal Steel Company, including the new cash capital (net), was approximately $62,000,000, as follows:

TABLE 8.—COMPARISON OF INDICATED VALUE OF PROPERTY (STOCKS AND CASH) ACQUIRED BY FEDERAL STEEL COMPANY AT ITS ORGANIZATION WITH THE AMOUNT OF ITS STOCK ISSUED.

Illinois Steel stock at par, plus surplus	$19, 238, 149
Minnesota Iron stock at par, plus surplus	22, 936, 134
Elgin, Joliet and Eastern stock, at 70 per cent of its par value	4, 200, 000

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[1] The use of market prices of the stock of a consolidation in such computations is as a rule open to objection, as such prices may reflect a value due to the very merger of competing concerns, but in this instance, owing to the comparatively small amount involved, it is permissible, and in any event gives a better basis than the use of the par value.

Lorain Steel Company and Johnson Company stock, estimated value		$4, 000, 000
Cash:		
Syndicate arrangement	$14, 075, 000	
Lorain-Johnson purchase	264, 455	
Total	14, 339, 455	
Less cash paid in connection with Lorain-Johnson purchase	2, 647, 231	
Net cash		11, 692, 224
Total indicated value of assets over bonded indebtedness		[1] 62, 066, 507
Federal Steel preferred stock issued		53, 260, 900
Indicated excess of value over par value of preferred stock alone		8, 805, 607
Total Federal Steel stocks issued, preferred and common		99, 745, 200
Total indicated value of assets over bonded indebtedness		[1] 62, 066, 507
Indicated deficiency of assets, as compared with total stock issued		37, 678, 693

It should be repeated that the above valuations are necessarily somewhat arbitrary and tentative. The earnings of the Illinois Steel Company and the prices of its securities indicate that the book value of that concern was excessive, whereas in the case of the Minnesota Iron Company the book valuation may have been conservative. The value allowed the Elgin, Joliet and Eastern stock probably is excessive, while that assigned the Lorain properties is the approximate cash cost. Taking conditions as they were in 1898, however, the available evidence suggests that an estimate of about $62,000,000, as the value of the properties acquired by the Federal Steel Company, after allowing for underlying bonds, is sufficient. The Bureau has, however, increased this to $63,000,000. This was over and above the bonded indebtedness of these concerns of $30,217,179, which has been considered as representing an equivalent investment.

This conclusion finds further confirmation in the market prices of Federal Steel stocks. Based upon the average prices for the latter part of 1898, the aggregate value of these stocks was approximately but $55,700,000, as follows:

Preferred stock, $53,260,900, at 75.4	$40, 158, 719
Common stock, $46,484,300, at 33.4	15, 525, 756
Total	55, 684, 475

The average prices in 1899 were 82.3 for the preferred stock and 57.4 for the common stock, which give a total valuation for the stock of approximately $70,500,000. The year 1899, however, as already noted, was one of abnormal prosperity in the iron and steel industry. The average prices of the stock in 1900 were 70.3 for the preferred and 42.6 for the common, giving an indicated valuation of both stocks of roughly $57,250,000. Taking the average prices of the stocks for the entire period from the organization of the company in 1898 to the close of 1900, the market valuation was about $61,150,000. An average valuation over so considerable a period is certainly entitled to considerable weight, and particularly because the Federal

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[1] See note 3, Table 5, page 118.

Steel Company was in no sense a monopoly. The close agreement between this valuation and the valuation indicated by the foregoing rough analysis of the property is striking.

From Table 6, on page 119, it appears that stockholders of the Illinois Steel Company, the Minnesota Iron Company, and the Elgin, Joliet and Eastern Railway Company, in return for the deposit of their stocks and payment of $9,251,627 in cash, received $46,258,135 of preferred and $37,006,508 of common stock of the new company. There was issued as part of the purchase price of the Lorain and Johnson companies $1,322,200 Federal Steel preferred and $1,054,800 common stock.[1] There was left for the syndicate, therefore, $5,680,565 of preferred stock and $8,422.992 of common stock in return for $4,823,373 of cash which the syndicate was to furnish in order to make up the stipulated total of $14,075,000. This arrangement may be summarized as follows:

	Preferred stock issued.	Common stock issued.
Total amount	[1] $53, 260, 900	[2] $46, 484, 300
Taken by original stockholders and by Lorain interests	47, 580, 335	38, 061, 308
Leaving for syndicate	5, 680, 565	8, 422, 992

[1] See note 1, page 119.

[2] Includes $3,000 issued to original subscribers, who presumably acted for the underwriting syndicate.

The payment of $14,075,000 in cash was provided as follows:

By original stockholders	$9, 251, 627
By syndicate	4, 823, 373
Total	14, 075, 000

The large residue of stock left in the hands of the syndicate—amounting to $5,680,565 preferred and $8,422,992 common—less the amount of cash ($4,823,373) provided by the syndicate on its own account, constituted the compensation of the syndicate.

This liberal compensation to the underwriting syndicate is very fairly to be considered as sustaining other evidence of extensive overissue of stocks of the Federal Steel Company.

The earnings of the Federal Steel Company likewise tend to the same conclusion. The earnings of the constituent companies for the nine months ending September 30, 1898, after deducting interest on bonds, were officially estimated in a listing application to the New York Stock Exchange at not less than $3.000,000, and those for the full year 1898 at a minimum of $4,000,000. This sum, it will be seen, was equivalent to less than 8 per cent on the $53,260,900 of preferred stock issued. The capitalization of an iron and steel concern under competitive conditions on a basis of 8 per cent undoubtedly must be regarded as extremely liberal. Including the common stock, these earnings were equivalent to only a little more than 4 per cent.

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[1] By this purchase, as already shown, there was secured $264,454.70 in cash; this, however, was in addition to the $14,075,000 above given.

The earnings of the company in 1899, after deducting interest on bonds of constituent companies and depreciation, were approximately $9,100,000. This, it will be seen, was at the rate of approximately 17 per cent on the $53,260.900 of preferred stock outstanding, and about 9 per cent on the preferred and common combined. The earnings in the year 1900 were $11,722,332, or about 22 per cent on the preferred stock alone. These earnings, however, were exceptional. For the first three months of 1901 they were at a very much lower rate.

Altogether, the evidence is strong that a considerable portion of the common stock of the Federal Steel Company represented nothing but "water," or the capitalized hope of future increase in earning power, and indicates that a valuation of $63,000,000, over and above the underlying bonds, at the time the company was organized (September. 1898) is sufficiently liberal.

As shown in Table 4, on page 113, the United States Steel Corporation issued in exchange for the stocks of the Federal Steel Company in 1901 a little over $110,400,000 of its stock, of which, roughly, $60,400,000 was in preferred stock and $50,000,000 in common stock. During the interval from its organization to April 1, 1901, of course, the investment of the Federal Steel Company had, as just shown, been increased from its earnings. The surplus of the company on March 31, 1901, was $18,146,700. Adding this to the original investment in 1898, and excluding any possible appreciation in the value of the property (see p. 168), it is clear that the stock issued by the Steel Corporation for the Federal Steel Company's stocks greatly exceeded the tangible property back of the latter.

Section 5. American Steel and Wire Company.

In the case of this corporation, organized in January, 1899, there is convincing evidence that preferred stock was issued up to the full value of the tangible assets acquired and that the common stock represented nothing but intangible assets, estimated earning power, and "water."

One of the principal companies acquired by the American Steel and Wire Company of New Jersey, the American Steel and Wire Company of Illinois, was itself an important consolidation, and for that reason the basis of its organization may be briefly reviewed.

American Steel and Wire Company of Illinois.—The American Steel and Wire Company of Illinois (see Table 3, facing p. 107) was organized in March, 1898, with a capital of $24,000,000, equally divided between 7 per cent cumulative preferred stock and common stock. The company acquired the following properties:

Consolidated Steel and Wire Company, with 7 plants.

The plants of the I. L. Ellwood Manufacturing Company, and of the Ellwood Wire and Nail Company, at De Kalb, Ill.

The plant of the American Wire Nail Company, at Anderson, Ind.

Two plants of the Salem Wire Nail Company, one at Salem, Ohio, and one at Findlay, Ohio.

The plant of the H. P. Nail Company, at Cleveland.

The plant of the American Wire Company, at Cleveland.

The facts concerning the organization of this company were disclosed in a suit brought in December, 1899, by John H. Parks, one of the promoters, against John W. Gates for an accounting of profits alleged to have been made in its promotion. The valuations at which the above concerns went into the Illinois consolidation (including working capital) and the profits of these concerns, averaged and adjusted over a series of years, as submitted in this Parks suit, are given in the following table:

TABLE 9.—APPRAISED VALUES AND EARNINGS OF CONCERNS COMPOSING AMERICAN STEEL AND WIRE COMPANY OF ILLINOIS IN 1898.[1]

Property.	Appraised value.	Yearly average adjusted profits (1895–1897).
Consolidated Steel and Wire Company, 7 plants (working capital included)	$7,000,000	$1,102,979.20
American Wire Nail Company's plant ($200,000 working capital included)	1,000,000	159,012.45
Salem Wire Nail Company, 2 plants ($100,000 working capital included)	500,000	93,233.21
I. L. Ellwood, 2 plants ($250,000 working capital included)	1,250,000	145,283.26
H. P. Nail Company, plant at Cleveland, Ohio	600,000	77,892.39
American Wire Company, plant at Cleveland, Ohio	600,000	77,154.49
Additional working capital and some small improvements to plants	1,050,000	....
Total	12,000,000	1,655,555.00

[1] As submitted by defense in suit of John H. Parks v. John W. Gates, on appeal, supreme court, New York, appellate division, first department.

As already noted on page 76, before the Illinois company was organized an effort was made, in 1897, to form a $75,000,000 consolidation, but this scheme fell through in February, 1898. Almost immediately afterwards the concerns above mentioned were consolidated as the American Steel and Wire Company of Illinois. The valuations placed upon the plants of these companies by engineers employed by J. P. Morgan & Co. at the time the $75,000,000 combination was under discussion were as follows:

Consolidated Steel and Wire Company (this included their plants at Allentown, St. Louis, Rankin, Joliet (2), Cleveland, and Beaver Falls)	$5,914,970
I. L. Ellwood's plants	923,000
American Wire Company plant, at Cleveland, Ohio	740,000
H. P. Nail Company plant, at Cleveland, Ohio	800,000
American Wire Nail Company plant, at Anderson, Ind	700,000
Salem Wire Nail Company plants, at Salem and Findlay, Ohio	450,000
Total	9,527,970

These figures apparently were for the plants alone, without working capital.

In the three years preceding the merger (1895–1897) these companies made a total average profit per year of $1,655,555, showing for those years a net profit of between 13 and 14 per cent if figured on a basis of $12,000,000.

The average profits above given, which were determined by a firm of chartered accountants employed by the bankers, were undoubtedly due in large measure to the exorbitant prices of wire and wire nails maintained by the wire-nail pool during a considerable portion of the period in question. (See p. 73.)

From Table 9, therefore, it appears that the American Steel and Wire Company of Illinois had $12,000,000 of tangible property; that is to say, its $12,000,000 preferred stock was covered by actual tangible assets. The $12,000,000 of common stock was issued as a bonus with the preferred.

The most important of these concerns was the Consolidated Steel and Wire Company. This had a capital stock of $4,000,000, which went into the American Steel and Wire Company of Illinois on the basis of $175 in preferred and a like amount of common for each $100 share of old stock, a total of $14,000,000.[1]

The $12,000,000 common stock of the American Steel and Wire Company of Illinois, while not covered by tangible assets, nevertheless had a value from the standpoint of earning power. This is suggested by the liberal rate of profit as above computed on the $12,000,000 preferred stock alone, namely, about 14 per cent. It is also indicated by the prices of the company's stocks. From July to November, 1898, the common stock of the company was quoted on the New York Stock Exchange at from 25⅛ to 43½, and the preferred from 82 to 92½. Higher quotations were reached in December, but these were undoubtedly due to the pending transfer of the company on very favorable terms to the American Steel and Wire Company of New Jersey. The average prices for the five months in question were about 34 for the common and 88 for the preferred. The combined market value, therefore, was considerably in excess of the par value of the preferred stock. It should be observed, however, that the large earning power of the company was attributable in considerable degree to the fact that it was a combination of some of the strongest factors in the business.

American Steel and Wire Company of New Jersey.—This company was organized in January, 1899, with $90,000,000 capital stock, all of which was issued, as follows:

Preferred stock (7 per cent cumulative)	$40, 000, 000
Common stock	50, 000, 000
Total	90, 000, 000

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[1] Testimony of John W. Gates, in the Parks suit, above cited.

In the organization of this company, the American Steel and Wire Company of Illinois was taken over on very liberal terms, namely, $100 of preferred stock and $60 in common stock of the new company for each $100 preferred stock of the old, and $120 in new common stock for each $100 of old stock. The actual amounts of stock issued by the New Jersey company for the Illinois concern in this exchange were as follows:

	New preferred.	New common.
$12,000,000 old preferred stock received	$12,000,000	$7,200,000
$12,000,000 old common stock received		14,400,000
Total	12,000,000	21,600,000

That is, in exchange for the $24,000,000 stock of the old company there was issued by the new concern $33,600,000.

In addition to the Illinois company, the American Steel and Wire Company of New Jersey secured most of the other important wire concerns of the country. Most of these are given in Table 3, facing page 107.[1] An underwriting syndicate was to provide $28,000,000 cash, of which $15,000,000 was to be used to purchase these additional concerns and the remaining $13,000,000 was to be turned over to the company as working capital. Adding to this $28,000,000 the $12,000,000 tangible property of the American Steel and Wire Company of Illinois at its organization, makes a total of $40,000,000, which is exactly the amount of preferred stock issued by the New Jersey company.

In the case of the properties purchased with the $15,000,000 cash provided by the underwriting syndicate, the good will was also secured, since the cash price included these properties as going concerns. This alone would suggest that part of the $40,000,000 preferred stock of the new company was issued for intangible assets. On the other hand, the common stock of the American Steel and Wire Company of Illinois, by the time of its transfer to the New Jersey company, may have been partly covered by tangible value. It seems reasonably certain that the $40,000,000 preferred stock of the latter concern was covered by actual property, including working capital.

That preferred stock was issued by the American Steel and Wire Company of New Jersey up to the full amount of tangible assets is, moreover, indicated by the following excerpt from an article in a trade journal at the time:[2]

> The syndicate of bankers furnishes the capital to make the purchases of the plants and to provide the new company with a

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[1] See note at head of that table.

[2] Iron Age, January 12, 1899, page 19.

> working capital of about $13,000,000, exclusive of the working capital of the concerns who enter the consolidation. As a matter of fact, the new company will have a working capital of $17,342,500, less $750,000 bonds, as above. Whatever may be necessary of this working capital may be used for the purchase of other properties, which may be agreed upon hereafter. The entire amount of capital to be furnished by the syndicate will be $28,000,000.
>
> The aggregate valuation of the plants which are included in the new consolidation is $23,407,500.

It will be seen that this statement, which appears to be authoritative, gives the entire working capital of the new company (including the $13,000,000 clear cash to be provided by the syndicate) at $17,342,500, less $750,000 of bonds to be provided for, which leaves a net cash capital of $16,592,500. This sum, added to the reported value of the plants, $23,407,500, amounts to exactly $40,000,000, which is precisely the amount of the preferred stock issued by the American Steel and Wire Company of New Jersey. While the value of the plants may have been arrived at by deducting the amount of working capital from the preferred stock, this statement, in connection with other evidence, seems to indicate beyond a reasonable doubt, in so far as it was authoritative, that it was the intention of the organizers to issue preferred stock up to the full amount of plant valuations and cash assets, and that the common stock at best represented nothing but intangible assets. Much of it must be considered as mere "water."

SUBSEQUENT ACQUISITIONS.—Shortly after its organization, the American Steel and Wire Company of New Jersey acquired several other properties. Most of these were comparatively small, with the exception of the Shoenberger Steel Company of Pittsburg, which was capitalized at $3,600,000, and which had an extensive plant. All of these later acquisitions were paid for in cash, and therefore it is reasonable to assume that they did not involve serious overvaluation.

The company did, however, in 1900, guarantee an issue of $5,630,000 of 5 per cent 20-year bonds of the American Steamship Company, of which $5,250,000 were issued in payment for the $3,000,000 capital stock of that concern (at the rate of $175 per share) and $380,000 reserved to retire prior liens. The property back of these bonds consisted of 12 steamers. The value of these as fixed by the Inland Lloyds was only $3,035,000, or practically $2,600,000 less than the bonds issued against them. In justification of the high price paid by the Steel and Wire company, it was contended that the net earnings of this steamship fleet were very large. This was true, the earnings in 1900 (not all of the steamers being in operation for the entire season) amounting to roughly $762,000, or more than 13 per cent upon the total indebtedness of $5,630,000 incurred by the American Steel and Wire Company in the acquisition of these vessels. However, this transaction precipitated a violent controversy in the management of the Steel and Wire company, because the stock of the steamship company had previously been owned by some of the leading directors and stockholders of the Steel and Wire concern, who had originally acquired the property at the equivalent of about par for the stock, which they later sold for $175 per share. Moreover, the steamship company had paid very liberal dividends during the interval that it had thus been operated by these parties, so that their total profit on the steamship deal was apparently in excess of $3,000,000, the bulk of which went to a comparatively few insiders in the American Steel and Wire Company's management. At least one director of the Steel and Wire company, it may be noted, resigned because of dissatisfaction over this transaction.[1]

Taking all the evidence into consideration, therefore, it appears that at the organization of the American Steel and Wire Company of New Jersey there were no tangible assets back of the $50,000,000 common stock, and that the issue of bonds to acquire the American Steamship Company's stock was in excess of the appraised value of the vessels acquired (this appraisal presumably not including an allowance for earning power).

The bulk of the common stock undoubtedly was nothing but "water." In this connection it may be noted that no less than $11,600,000 of the common stock was distributed among a few leading interests who managed the underwriting. As shown on page 130, $12,000,000 of the $40,000,000 preferred stock of the company and $21,600,000 of its common stock was issued for the stock of the American Steel and Wire Company of Illinois. This left $28,000,000 preferred stock and $28,400,000 common stock of the New Jersey concern which was disposed of to a syndicate for $28,000,000 in cash. The syndicate subscribers received a bonus of 60 shares in common stock with each 100 shares of preferred taken at par. This left 40 shares out of each 100 shares of common, or $11,600,000, as a "commission" for those managing the organization of the company.[2]

This large "commission" is very convincing evidence that the common stock of the company was heavily "watered."

The common stock of the company, however, had a value from the standpoint of earning power. For the year 1899 the surplus earnings of the Steel and Wire company, after the dividends on the preferred stock, and after setting aside $1,200,000 for depreciation and bad debts, were $9,362,530. This was equivalent to 18.7 per cent for the common stock. The corresponding surplus profits for the year 1900 were $4,202,129, or 8.4 per cent for the common stock. Moreover, dividends were paid on the common stock out of the earnings of 1899 at the rate of 7 per cent and out of those for 1900 at the rate of 5 per cent.

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[1] Hermann Sielcken, one of the directors who resigned, was quoted at the time as saying (Chronicle, Dec. 15, 1900):

> I confess myself unable to understand why the American Steel and Wire Company, professing to have $90,000,000 of capital, should issue $5,000,000 [$5,630,000] in bonds for the purchase of 12 ore steamers when 12 new boats of the same tonnage could today be contracted for and delivered in the spring of 1902 for between $3,000,000 and $3,300,000, and there is plenty of tonnage to be had for the intervening season. Seventy-five per cent of the American Steamship Company's stock was right there in the American Steel and Wire directors' meeting. Of course, I resigned.

[2] The common stock was, of course, worth much less than par.

On March 31, 1901, the accumulated surplus of the company was $13,162,106. To this extent, therefore, assuming the allowance for depreciation to have been adequate, the " water " in the common stock had been reduced. In other words, at the time of the transfer of the Steel and Wire company to the Steel Corporation its tangible property alone was considerably in excess of the $40,000,000 preferred stock.

Undoubtedly the organizers of the United States Steel Corporation considered the earning capacity of the company more carefully than they did its tangible assets. Therefore, it should be pointed out that the earnings above noted, particularly those for 1899, were due in large measure to the extraordinarily prosperous condition of the iron and steel industry at this period. Obviously, exceptional earnings made under these conditions are not alone a proper basis for capitalization. A more important matter, and one which undoubtedly received more attention in the organization of the Steel Corporation, was the high degree of control over the wire and nail industry enjoyed by the American Steel and Wire Company, which undoubtedly had an important influence upon the earning capacity of the company. While the Steel Corporation could not, perhaps, reasonably expect to make such large earnings from the wire and nail business as the American Steel and Wire Company had made in 1899, nevertheless the high degree of monopolistic control of this branch of the industry which it obtained through the acquisition of this company gave it virtual assurance that a liberal rate of profit could be earned so long as this control was maintained.

Section 6. American Tin Plate Company.

This company was one of the first of the great iron and steel consolidations, having been organized in December, 1898. Its total authorized capitalization was $50,000,000, of which $46,000,000 was issued at the time, as follows:

Stock.	Authorized.	Issued.
Preferred (7 per cent cumulative)	$20,000,000	$18,000,000
Common	30,000,000	28,000,000

Soon after its organization the company issued $325,000 additional preferred stock to acquire another concern. As shown in Table 4, on page 113, the United States Steel Corporation, in acquiring the Tin Plate company, issued practically $63,500,000 of its stock ($28,505,250 preferred and $34,993,750 common). Thus the increase in capitalization was, roughly, $17,000,000.

The American Tin Plate Company was one of the group of four "Moore" companies, namely, the American Tin Plate Company, the National Steel Company, the American Steel Hoop Company, and the American Sheet Steel Company, so called because they had been organized chiefly by W. H. Moore.

All of these companies were heavily overcapitalized. In fact, the evidence very clearly shows that the common stocks of these companies originally had no tangible property whatever back of them. This was indeed very frankly admitted by Mr. Moore, in testimony before the Industrial Commission on the organization of the American Tin Plate Company, as the following excerpt from that testimony shows:

> Everybody knows what they are getting when they get common stock. They know they are not getting anything that represents assets.[1]

Evidence as to the "watering" of these companies, however, does not rest simply on this general statement, but is borne out by various other more specific facts.

In the case of the American Tin Plate Company, the testimony of several of its officers before the Industrial Commission showed clearly that options were obtained upon the various properties and that the vendors were then given the privilege of taking the full option price in cash or of receiving instead preferred stock equal to the amount of such cash valuation, with a bonus of 100 per cent in common stock in addition.

The organizers of the company also raised $4,500,000 of cash capital; this was obtained from the sale of preferred stock at par, subscribers in this case also receiving an equal amount of common stock as a bonus. A part of this cash was used in the purchase of inventories and other working assets of the acquired concerns, such liquid assets not being included with the transfer of plants.

The cash valuations agreed upon for the various plants covered these as going concerns, and therefore included intangible as well as tangible considerations. This is clearly established by the following excerpt from the testimony of D. G. Reid, president of the company, before the Industrial Commission:

> Q. If a man had got an option on a plant for $100,000 in cash, he could take that cash and quit business?—A. Yes.

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[1] Industrial Commission Reports, Volume I, page 963.

> Q. If he preferred to take instead of cash $100,000 worth of preferred stock and a $100,000 in common stock, he could do that?—A. Yes; Judge Moore would let him have it.
>
> Q. The price, then, that Judge Moore and these tin-plate manufacturers agreed upon was on a cash basis, and that would include, would it not, the value of the plant and the value of the business in general?—A. Good will and all.
>
> Q. The good will and all?—A. Yes.
>
> Q. So that, as a matter of fact, the price that was agreed upon, the cash price agreed upon, would mean both the value of the plant itself and the good will?—A. Certainly; yes.[1]

The plants of the constituent concerns, plus the new working capital, represented the total tangible property acquired by the American Tin Plate Company. From what has just been stated, therefore, it is clear that preferred stock was issued up to the full amount of the cash value of the property acquired by the new company, and that the common stock was issued merely as a bonus with the preferred, or, as shown elsewhere (see p. 178), for promoters' profits and organization expenses.

That preferred stock was issued up to the full cash value of the property is indicated by the following further excerpt from the testimony of Mr. Reid before the Industrial Commission, already referred to:

> Q. Did you not consider that the preferred stock practically paid for the plants, for the tangible property?—A. As I have already said, Judge Moore paid for the plants in cash. It was a cash transaction. However, if an owner of tin-plate property would come to him and say, "I do not care for mine in cash; I will take so many shares in stock," he would get from him a share of common and a share of preferred stock for each $100 that he did not take out in cash.
>
> Q. No matter how many transactions were involved in it, and by what circumlocution it was brought about, as a matter of fact, did you not consider generally that the preferred stock paid for the tangible property that was acquired?—A. Well, if a mill had $100,000 cash coming to it from Judge Moore and he gave them $100,000 in preferred and $100,000 in common stock, that man would know that he was getting preferred stock for his $100,000, and whatever he got beyond might be said to be so much bonus.[2]

It should be noted that while the $28,000,000 common stock issued by the American Tin Plate Company represented at the time nothing but "water," by April, 1901, this common stock had considerable value as a result of the great earning power of the company. The earnings of the constituent concerns of the Tin Plate company for the year 1898—that is, for the year preceding their consolidation, when they were operating separately—were officially stated in a listing application of the company to the New York Stock Exchange at $2,000,000. This was equivalent to about 11 per cent on the preferred stock issued by the consolidated company. The earnings of the company in the year 1899 were approximately $3,600,000, and those for the year 1900 exceeded $5,750.000. The accumulated surplus on March 31, 1901, was $6.177,537, so that to some extent the common stock of the company had actual cash assets back of it at that date.

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[1] Industrial Commission Reports, Volume I, page 884.

[2] Industrial Commission Reports, Volume I, pages 883–884.

As in the case of the American Steel and Wire Company, it is important to point out that the great earning power of the American Tin Plate Company was largely attributable to two circumstances—first, the extraordinary prosperity of the iron and steel industry at this time, and, second, to the very effective control of the tin-plate business which that company held. As already shown, the company at its organization had an almost complete monoply of the tin-plate business. Shortly after this, moreover, the company entered into agreements with leading manufacturers of tin-plate machinery with a view to hindering the development of competition, and in this it was for a time partially successful. The monopolistic position of the company in its branch of the steel industry, therefore, obviously made its acquisition particularly desirable, from the standpoint of the Steel Corporation, since a liberal profit in this department of the business was virtually assured.

From what has been said it would appear that the value of the property, tangible and intangible, acquired by the American Tin Plate Company at its organization in December, 1898, did not exceed $18,325,000, the amount of the preferred stock issued—this including the $325,000 additional preferred stock issued shortly after the company commenced business. While the investment by April 1, 1901, had been increased somewhat by the reinvestment of surplus profits, there can be no reasonable doubt that the issuance by the United States Steel Corporation of approximately $63,500,000 of its stock for the property of the American Tin Plate Company meant that many millions of this stock were issued for intangible considerations, while many millions more represented nothing but mere " water."

Section 7. National Steel Company.

The capitalization of this company at its organization, in February, 1899 (exclusive of $1,000,000 preferred stock issued somewhat later), was as follows:

Stock.	Authorized.	Issued.
Preferred (7 per cent cumulative)	$27,000,000	$26,000,000
Common	32,000,000	32,000,000
Underlying bonds		2,561,000

Testimony of William E. Reis, president of the company, before the Industrial Commission in October, 1899, showed that the company had been organized along substantially the same lines as the American Tin Plate Company and the American Steel Hoop Company; that is to say, the former owners of the properties acquired were given the option of taking a cash price or of taking part or all of the payment in stock of the new company. Where payment was taken in stock, preferred stock was given up to the amount of the cash option price, and 100 shares of common stock were given with each 100 shares of preferred. It will be noted that the authorized amount of common stock exceeded the amount of the preferred by $5,000,000. This excess went to the promoters. The following excerpt from the testimony of Mr. Reis is in point:[1]

> We [the owners of the constituent concerns] gave an option in this way: We gave an option for cash with the privilege to take all cash, or part cash and part stock, or all stock, at our option. We exercised the option at the completion of the company and took all stock.
>
> Q. At what rates was the stock taken?—A. We took one share of preferred stock for each $100 of cash [value], and with each share of preferred stock we got one share of common; so we got a share each of preferred and common for each $100 of value.

Preferred stock, with an equal bonus of common stock, was likewise issued for the working capital, of which the company had about $9,000,000 when it commenced business.

It appears, therefore, that the total cash value of the property and cash assets acquired by the company at its organization, over and above its underlying bonds, did not exceed the $26,000,000 preferred stock issued. It is probable that the cash prices were chiefly determined by the value of the tangible assets alone.

Later in 1899 the company issued $1,000,000 of its preferred stock to acquire certain property of the Oliver & Snyder Steel Company, this purchase including a blast furnace, a tract of 803 acres of coking-coal lands, and a 10-year contract for the production of 700 coke ovens of the Oliver & Snyder concern, as well as a contract for a one-sixth share of the ore production of the Oliver Iron Mining Company. The transaction involved the assumption of $250,000 underlying bonds on the furnace property. In view of the substantial consideration acquired, however, it seems entirely reasonable to assume that there was no overvaluation in this additional issue of preferred stock.

From time to time as the company extended its investments, particularly in ore and steamship property, it incurred further indebtedness, the total at the time of its absorption by the United States Steel Corporation being about $7,000,000.

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[1] Industrial Commission Reports, Volume I, page 944.

From what has been said it appears that the $32,000,000 common stock of the National Steel Company originally represented nothing but earning power and "water." The company was, however, one of the most successful of the large iron and steel consolidations, and its great earning power unquestionably gave a value to the common stock aside from any consideration of tangible property. The earnings of the company in the first year of its operations, after deducting interest charges, were approximately $8,750,000, or 32½ per cent on the preferred stock. The directors, however, wrote off $3,617,000 as depreciation, so that the net surplus at the close of February, 1900, after allowing for the full year's dividend on the preferred stock, was about $3,233,000, or a little over 10 per cent on the common stock. During the period from March 1, 1900, to April 1, 1901, when the company was acquired by the Steel Corporation, it made further large earnings, and the undivided surplus on April 1, 1901, amounted to $6,910,995. This addition to its investment, however, as pointed out in the case of the American Tin Plate Company, was undoubtedly a less important consideration from the standpoint of the Steel Corporation than the great earning capacity of the company. This earning capacity was largely due to the great increase in prosperity in the industry as compared with the period prior to its organization, but was also probably due in some measure to the influence of consolidation, although the National Steel Company had no monopoly of the products which it handled, as the American Tin Plate Company had. On the other hand, owing to its close affiliation with the American Tin Plate and American Sheet Steel companies, it had a more or less exclusive market for a considerable part of its production of crude and semifinished steel (billets, bars, etc.), and this may have had an important bearing upon its earning capacity.

As shown in Table 4, on page 113, the United States Steel Corporation issued roughly $73,700,000 of its stocks for $26,992,200 preferred and $31,969,800 of the common stock of the National Steel Company, or at the rate of $125 of its preferred for every $100 of National Steel preferred and $125 of its common for every $100 National Steel common.

Section 8. American Steel Hoop Company.

The American Steel Hoop Company was organized in April, 1899, with the following authorized capitalization, all of which was issued:

Preferred stock (7 per cent cumulative)	$14,000,000
Common stock	19,000,000
Total	33,000,000

The organization of the company was conducted by W. H. Moore in connection with New York bankers. C. S. Guthrie, then president of the company, in testimony before the Industrial Commission in October, 1899, said that the organization of the American Steel Hoop Company, the American Tin Plate Company, and the National Steel Company was "substantially the same in every respect." This means that the promoters determined upon a cash valuation of the plants, and then gave the vendors the option of taking cash or of taking preferred stock up to the amount of such cash valuation of the property, with an equal amount of common stock thrown in as a bonus. Moreover, in view of what has already been said in the case of the Tin Plate and National Steel companies, the above statement of President Guthrie indicates that the cash valuation covered intangible as well as tangible considerations. In other words, all of the common stock of the company at its organization was nothing but "water," or the capitalization of future hopes.

It will be noted that the issue of common stock exceeded that of the preferred by $5,000,000. This went to the promoters for "organization expenses."

The company at its organization had a cash working capital of about $3,000,000.

Not only was the common stock issued as a mere bonus, but it is a fair question whether the preferred stock of the American Steel Hoop Company was fully covered by property value. The earnings of the company during the first nine months of its organization amounted to $720,000. This is at the rate of less than 7 per cent per year upon the $14,000,000 preferred stock. The earnings of the next year, however, were decidedly larger, but the accumulated surplus of the company on March 31, 1901, was only $1,660,311.

A further indication that the preferred stock may have included some "water" is found in the market quotations of the company's stocks, which in the main sold at relatively much lower prices than those of several of the other companies previously discussed.

As already shown, the preferred stock of the company was exchanged at par for preferred stock of the Steel Corporation, and the common stock at par for the common stock of that concern.

Section 9. American Sheet Steel Company.

This consolidation, which has already been referred to on page 91, apparently was organized on the same general lines as were followed in the case of the other "Moore" companies; that is, the promoters determined upon the cash valuation for the plants to be acquired, and then gave the vendors the option of taking payment in cash or in preferred stock up to the full amount of the cash valuation with a bonus of 100 per cent in common stock. The cash working capital was raised on the same terms.

The plan of organization in the case of the American Sheet Steel Company, however, was somewhat different from that in the case of the American Tin Plate, National Steel, and American Steel Hoop companies, as above described, in that the amounts of common and preferred stock were identical. These amounts were as follows:

Stock.	Authorized.	Issued.
Preferred (7 per cent cumulative)	$26,000,000	$24,500,000
Common	26,000,000	24,500,000
Underlying bonds		2,000,000

In the case of the three other "Moore" companies, it will be recalled, there was an excess of common stock over the preferred, all of which was issued to the promoters for organization expenses and their profits. There can be little doubt that the promoters likewise received a large amount of stock in the case of the American Sheet Steel Company. Indeed, it seems probable that in addition to receiving a block of common stock they received a substantial block of preferred stock as well.

In this connection it may be noted that the Iron Age, in discussing the organization of the company in its issue of February 22, 1900, about the time the negotiations were being consummated, stated that $4,000,000 of preferred stock and the same amount of common stock were to be issued for cash, while $12,000,000 preferred and $12,000,000 common were to be issued for the plants that were going into the consolidation. This article stated that the remaining $10,000,000 of each class of stock would be retained in the treasury, whereas instead, as shown above, all but $1,500,000 of each class of stock was issued.

If the above statement were correct, it would appear that the total property value acquired by the company was $16,000,000 ($4,000,000 cash and $12,000,000 in plants) and consequently that the remaining $8,500,000 of preferred, as well as all of the common stock, may have been issued either as a bonus or as a compensation to the organizers. This, however, can not be definitely stated; the organizers of the company, when questioned by the Bureau, declined to discuss the amount of the promoters' commission, professing to have no records or recollection as to its amount.

It is certain, however, that preferred stock was issued by the American Sheet Steel Company in excess of any fair valuation of the property, including cash capital. The company at its organization acquired 164 sheet mills, several open-hearth furnaces and bar mills, as well as 19 puddling furnaces. An allowance of $40,000 as the value of an ordinary mill (including land for the site) at that time would undoubtedly be liberal, so that the total value of the 164 mills acquired would be only about $6,500,000. The additional plants of the company could not have been worth more than a few million dollars. The Bureau has, therefore, valued the plants of this concern at $12,000,000, allowing $1,000,000 more for detached real estate, and has valued its natural-gas property at $2,000,000 (see p. 185), and the working capital at $4,000,000, a total of $19,000,000; against this, however, should be placed the bonded debt of $2,000,000.

In this connection it may be noted that in 1900 the common stock of the company (as quoted in the Pittsburg market) did not sell above 23, while it sold as low as 15; the highest for the preferred stock in that year was 76¾ and the lowest 55. Taking the highest quotations of the two stocks together the sum is a little less than the par of the preferred stock alone, while at the lowest quotations one share of preferred and one share of common together were worth but 70. These low prices are very good evidence of unusually heavy overcapitalization in the case of this company, and particularly as this was a period of high prices for sheet-steel products. In the early part of 1901 the prices of these stocks advanced sharply, but this undoubtedly was due to the prospective organization of the United States Steel Corporation.

The earnings of the company for the period from March 29, 1900, the date of its organization, to December 31 of that year, were only $564,543; in the first three months of 1901, they were $1,111,937, but the surplus of the company on March 31, 1901, was only $705,757, showing that the company had made only an unimportant increase in its investment from operations.

As already shown, the Sheet Steel stocks were taken over by the Steel Corporation at par in new preferred and new common, respectively.

Section 10. National Tube Company.

The capitalization of this company at its organization in 1899 consisted of $40,000,000 of 7 per cent cumulative preferred stock and $40,000,000 common stock, practically all of which was issued.

The company was organized along lines substantially similar to those adopted in the case of the American Steel and Wire Company; that is, preferred stock was issued up to the full amount of the tangible assets, including working capital, while the common stock was issued as a bonus with the preferred and for organization expenses and promotion services. It appears that $50 of the common stock were thus issued with each $100 of preferred for each $100 of property value or cash acquired. The remaining 50 per cent of the issue of common stock appears to have gone to the promoters for organization expenses and their profit.

According to an official statement filed with the New York Stock Exchange, the company commenced business on July 1, 1899, with net current assets of approximately $16,100,000. Deducting this amount from the $40,000,000 of preferred stock issued would leave approximately $24,000,000 to represent the plants acquired.

The most important companies acquired were the National Tube Works Company, with plants at McKeesport and Pittsburg, Pa., and the Riverside Iron Works, with plants at Wheeling and Benwood, W. Va., and Steubenville, Ohio. A balance sheet of the National Tube Works Company as of July 1, 1899, gave the plants at $8,118,000 and the net current assets at $6,086,000, a total of more than $14,000,000. It is probable, however, that this balance sheet valuation was excessive. A special reason for this conclusion is that not long after the properties were transferred to the United States Steel Corporation in 1901, it was found necessary to reconstruct to a very large extent the plants of the National Tube Works Company. (See p. 266.)

The balance sheet of the Riverside Iron Works as of July 1, 1899, gave the plants at $1,943,000 and other net assets at $2,200,000.

Assuming that the plants of the two concerns were worth the sums at which they were entered on the balance sheets ($10,061,000), and accepting the value of all the plants acquired by the National Tube Company at $24,000,000, would leave $13,939,000 for the remaining plants acquired.

The remaining plants were those of the following companies:

Pennsylvania Tube Company, Pittsburg, Pa.
Oil City Tube Company, Oil City, Pa.
National Galvanizing Works, Versailles, Pa.
Syracuse Tube Company, Syracuse, N. Y.
Delaware Iron Company, New Castle, Del.
Allison Manufacturing Company, Philadelphia, Pa.
Cohoes Tube Works, Cohoes, N. Y.
Ohio Tube Company, Warren, Ohio, and Morristown, Pa.
American Tube and Iron Company, Middletown, Pa., and Youngstown, Ohio.
Chester Pipe and Tube Company, Chester, Pa.
Oil Well Supply Company, Pittsburg, Pa.

These smaller plants entering the consolidation had an annual capacity of about 650,000 tons of iron and steel wrought pipe, which, based upon a valuation of $13,939,000, would be equivalent to approximately $20 per ton capacity.

The aggregate capacity of the National Tube Works and the Riverside Iron Works in finished products was about 350,000 tons, which, on the basis of $10,061,000 as the value of their plants, would give an average of about $30 per ton. These two companies, however, had, in addition to finishing mills, blast furnaces and steel works, while the Riverside Iron Works had some coal property as well. A higher average price per ton of capacity, therefore, would naturally have been paid for these two principal concerns than for the smaller concerns just enumerated.

In this connection it may be noted that the original agreement for the organization of the National Tube Company contemplated the purchase of several other tube concerns generally similar to the group of 11 just mentioned, but that in the final organization of the company these were omitted. In lieu of transferring these companies, the organizers of the company agreed to pay the National Tube Company $2,500,000 in cash. The capacities of the plants thus omitted aggregated about 150,000 tons of pipes and tubes. On this basis, the cash payment or forfeit of $2,500,000 would be equivalent to about $17 per ton as compared with an indicated valuation of $20 per ton for the group of 11 concerns above enumerated. While such a comparison is necessarily arbitrary, it tends to show that an allowance of approximately $14,000,000 for the 11 plants in question is sufficiently high.

The available evidence, therefore, indicates that the common stock of the National Tube Company at its organization was of practically the same sort as the common stocks of most of the other large consolidations discussed in this chapter; that is, that it was not represented by actual property values.

The National Tube Company, however, was one of the most successful of the constituent concerns of the United States Steel Corporation, and by the time that it was acquired by the latter its common stock had a high market value because of the company's earning power. For the year ended June 30, 1900, the profits of the company, after deducting all expenses, exceeded $14,600,000, and after deductions for depreciation, bad debts, etc., the net earnings were $13,878,000. This, it will be seen, was at the rate of nearly 35 per cent on the $40,000,000 of preferred stock outstanding, and at the rate of 17 per cent on the total capitalization of $80,000,000. After allowing for the full 7 per cent dividend on the preferred stock, the remaining surplus earnings were equivalent to 28 per cent on the common stock. From the standpoint of the United States Steel Corporation, therefore, the common stock of the National Tube Company had a considerable value regardless of the extent to which it was covered by tangible assets. It may be noted, moreover, that on April 1, 1901, the company's books showed a surplus of $27,484,569, so that at that date the common stock had a very considerable amount of tangible assets back of it as well as earning power.

The earnings of the company for the fiscal year 1900 undoubtedly reflected the unusual prosperity of the period and therefore were not a proper basis for judging the value of the property under ordinary conditions. However, the National Tube Company substantially dominated its branch of the steel industry. In a listing application to the New York Stock Exchange in February, 1900, the company stated that it had fully 90 per cent of the country's capacity of tubular goods. As already shown, this appears to have been an overstatement, and 75 per cent seems a more accurate figure. This, however, made it the dominating factor in this branch of the industry.

As shown in Table 4, for $79,934,800 stock of the National Tube Company the Steel Corporation issued $103,432,991 of its stock, an increase, therefore, of $23,498,191.

Section 11. Shelby Steel Tube Company.

This was a New Jersey company with $15,000,000 authorized capital stock ($6,000,000 preferred and $9,000,000 common), formed in 1900 as a reorganization of the Shelby Tube Company of Pennsylvania, a $10,000,000 concern.

It is probable that the common stock of the reorganized company was little more than "water." This is indicated by the details of the reorganization given in the accompanying footnote,[1] and also by the quotations of the company's securities on the Chicago Stock Exchange, which were as follows in the years 1900 and 1901:

Year.	Preferred stock.		Common stock.	
	Highest.	Lowest.	Highest.	Lowest.
1900	86	38	27	5
1901	58	30	15	6

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[1] The scheme of reorganization is indicated by the following excerpt from an article in the Economist of Chicago in its issue of February 10, 1900, which appears to have been taken from a prospectus:

	Authorized.	Issued.
Preferred stock	$6,000,000	$5,000,000
Common stock	9,000,000	8,150,000
Total	15,000,000	13,150,000

	Preferred.	Common.
Issued to subscribers at par for preferred	$1,311,800	$1,311,800
To acquire capital stock ($7,376,400) of present [the Pennsylvania corporation] company on basis of 50 per cent in new preferred and 75 per cent in new common	3,688,200	5,532,300
Balance for fees, expenses, organization, etc		1,305,900
Total issue	5,000,000	8,150,000

The exact amount of "water" in the stock is a matter of minor importance, however, since the United States Steel Corporation in acquiring the stocks of the Shelby Steel Tube Company effected a very drastic reduction in capitalization. These stocks were acquired on the following terms: One share of United States Steel preferred for each 2⅔ shares of Shelby Steel Tube preferred; 1 share of United States Steel common for each 4 shares of Shelby Steel Tube common. In other words, the Shelby Steel Tube preferred received 37½ per cent in United States Steel preferred, and the Shelby Steel Tube common 25 per cent in United States Steel common.

At that time (June, 1901) United States Steel preferred stock was selling about par, and the common stock at about 50. Had the entire amount of Shelby Steel Tube stock been exchanged, and the United States Steel shares received therefor sold at these average prices, the net cash return to Shelby Steel Tube stockholders would have been as follows:

50,000 shares of Shelby Steel Tube preferred would have received 18,750 shares of United States Steel preferred, which at par would have been worth	$1,875,000
81,515 shares of Shelby Steel Tube common would have received 20,378 shares of United States Steel common, which at 50 would have been worth	1,018,900
Total	2,893,900

As a matter of fact, not all the stock of the Shelby concern was immediately exchanged. The exact amounts exchanged during 1901 are given in Table 4, on page 113. However, in this rough estimate of the total value of the Shelby concern, the entire amounts of its stock should be taken into consideration.

While this total of $2,893,900 does not necessarily indicate the exact cash value of the Shelby Steel Tube concern, it may fairly be said to represent the approximate cost of the Shelby Steel Tube property to the Steel Corporation, reduced to a cash basis. (See note, p. 124.)

Through the acquisition of this concern the Steel Corporation established its supremacy in the seamless tubing branch of the steel industry.

Section 12. American Bridge Company.

This company was incorporated in May, 1900. Its authorized and issued capitalization at the time of its organization were as follows:

Stock.	Authorized.	Issued.
Preferred (7 per cent cumulative)	$35,000,000	$30,527,800
Common	35,000,000	30,527,800

By the time the company was acquired by the United States Steel Corporation the outstanding preferred stock had been increased to $31,373,800 and the common stock to $30,950,800.

The promotion of this company was handled by I. Gifford Ladd, of Providence, R. I., who was to receive, in consideration of the transfer of the various properties to the Bridge company, $20,499,000, par value, of its preferred stock, and $34,999,000, par value, of its common stock, together with the sum of $5,500,000 in cash ($1,000, par value, of the preferred stock, and $1,000, par value, of the common stock, was issued to the original incorporators for cash). However, as a part of the transaction Mr. Ladd agreed to purchase the remaining $14,500,000 of preferred stock, which was to be issued for cash at par. In other words, leaving out of consideration the small amount of incorporators' stock, the entire $35,000,000 of preferred stock and $35,000,000 of common stock which it was originally proposed to issue were to be delivered to the promoter in return for the properties, plus $14,500,000 in cash, from which gross amount of cash, however, $5,500,000 was to be turned back to the promoter, apparently to purchase certain concerns which were not ready to take stock or which demanded a part of the payment in cash. The promoter having been unable to deliver nine of the properties the purchase of which was originally contemplated, surrendered under abatement arrangement $4,772,200 of preferred stock and an equal amount of common stock, thus making the total amount of each class originally issued $30,227,800; this was shortly increased to $30,527,800 of each class.

The precise arrangement between the promoter and the various vendors is not definitely known, but it appears that in most cases the vendors were allowed 100 per cent of the cash valuation of their plants in preferred stock, with a large bonus in common stock. It may be noted that the promoter sold $14,500,000 of preferred stock to bankers for cash at par, allowing them as syndicate managers a bonus of $7,250,000 in common stock as their commission, and allowing the participants in a syndicate to be organized by these bankers a further amount in common stock equivalent to 30 per cent of any sums which these syndicate participants should be actually called upon to pay in cash. It seems probable that this arrangement was made in order to relieve the promoter from the necessity of raising the large amount of cash.

Of the $14,500,000 total cash capital provided, approximately $12,670,000 was expended for plants and for working capital, this amount including the $5,500,000 paid to the promoter. This left a net cash balance on hand of $1,832,000. The amount of working assets thus acquired (as distinct from plants) was approximately $9,700,000, the balance of the original cash presumably being used in the purchase of plants. The total cash and cash capital for working purposes provided the company was, therefore, approximately $11,500,000. Deducting this from the amount of preferred stock originally issued ($30,527,800) leaves a balance of approximately $19,000,000 for the plants originally acquired, to which should be added preferred stock subsequently issued, amounting to about $850,-000, making the grand total of tangible assets acquired $31,374,000, and of the plants alone $19,874,000.

On March 31, 1901, the American Bridge Company had a surplus of $4,030,331. As shown in Table 4, the preferred stock received 110 in United States Steel preferred and the common stock 105 in United States Steel common.

Section 13. Lake Superior Consolidated Iron Mines.

This company was organized under New Jersey laws in 1893, with an authorized capital of $30,000,000, all common stock, of which about $25,000,000 was issued at the time. At the date of its absorption by the United States Steel Corporation, in April, 1901, the outstanding stock of the company was $29,424,594. The company at one time created a mortgage of $10,000,000, under which about $1,500,000 in bonds were issued. These were subsequently redeemed, and in 1898 the mortgage was canceled.

The company was a consolidation of the mining properties of the Wetmore, Merritt, and Rockefeller interests, but was commonly known as a Rockefeller concern. The Wetmores and the Merritts, in the development of their mining properties and the Duluth, Missabe and Northern Railway, had become heavily indebted to the Rockefeller interests, with the result that when the panic of 1893 occurred they were practically bought out by the latter.

Such meager evidence as is available as to the organization of the company indicates that it was capitalized on an extravagant basis. One report at the time made it appear that the mining properties on the Mesabi Range went in on a basis of about $17,000,000, and the railroad and its ore docks at $2,000,000; in addition there were mines in Michigan and Wisconsin, and elsewhere. These figures can not be considered as reliable, but there can be no doubt that by far the greater part of the $25,000,000 stock originally issued was for the mining properties in the Mesabi district. It may be noted that the Iron Age, in discussing the company in its issue of December 26, 1895, stated:

> Owing to some circumstances connected with the formation of this company, * * * it is difficult to separate the cost of these mines from that of the money paid for the road, which is also one of the properties of the corporation. It is safe to assume that $1,500,000 has paid for all the so-called Merritt properties put into the Consolidated, and to cover all expenses connected with their admission into the company. These properties, some

> of which are fee and some lease, are believed by the most conservative to contain not less than 70,000,000 tons of ore, considerable of which is, naturally, non-Bessemer. In addition to these the company have the Adams mine, the recent purchase from the Roucheleau-Ray Company, the Lake Superior and the McKinley. These have been gathered in at a cost of about $2,300,000, and contain not less than 95,000,000 tons of ore. The Lake Superior leases alone are estimated at 50,000,000 tons, while the Adams lease is put down for far less than its owners would themselves estimate it. The holdings of this company are therefore put at 165,000,000 tons, and secured at a cost of less than $4,000,000. There is in addition the railroad property belonging to the consolidation, which cost what it was worth, except that the county of St. Louis gave it $250,000 under the belief that the Merritts had control. While all these properties are not operated by the Consolidated company, they are so tied up as to be obliged to ship over their road, and enter into the consideration of their holdings so far as tonnage is concerned.

While such a newspaper account can not be regarded as authoritative, it clearly indicates that the stock of the company originally was heavily watered. This is further indicated by the prices of the stock. Shortly after the company was organized its shares are reported to have sold at about $75 to $80, but in the depression of the middle nineties they sold as low as $9 a share and as late as 1898 they sold at $25 per share. The highest reported price in the boom of 1899 was about $60 per share; during 1900 it was quoted around $75 per share. Just prior to the organization of the Steel Corporation, the stock advanced very sharply, but this was obviously due to the very favorable terms upon which it was taken over by that concern, namely, 135 per cent in United States Steel preferred stock and 135 per cent in United States Steel common. However, sales of the stock were comparatively infrequent, and, furthermore, the company had never paid a dividend, so that the market price can not be regarded as a very safe indication of a fair valuation. At the same time, such information as is available concerning the organization of the company and the prices of its stock suggest that its capital at the start was heavily "watered."

The Lake Superior Consolidated Iron Mines, according to a listing statement submitted to the New York Stock Exchange by the Steel Corporation, had ore reserves in 1901 of from 300,000,000 tons to upward of 400,000,000 tons. It should be noted that much of this ore property was merely leased and not owned, so that to this extent the interest of the company was merely an equity in the ore.

One very valuable asset of the company was the Duluth, Missabe and Northern Railway, of which it owned the entire outstanding $2,512,500 capital stock. At the time of the transfer of the Lake Superior Consolidated Iron Mines to the Steel Corporation this road had outstanding $7,765,000 of bonds, of which $2,305,000 were owned by the Lake Superior Consolidated Iron Mines.

The road extends from Duluth into the Mesabi Range, and in 1901 had a main line of about 120 miles of track, with second tracks, sidings, etc., of about 100 miles. It is chiefly concerned in the transportation of iron ore. Like the Duluth and Iron Range Railroad (see p. 123) the Duluth, Missabe and Northern was able to operate at a very low cost. The average earnings of the road for the period 1897–1900, after deducting interest on bonded debt, were equivalent to about 21 per cent on the outstanding stock, while the earnings in 1900 alone were at the rate of nearly 58 per cent. There can be no doubt that this railroad was a very important consideration to the Steel Corporation in the purchase of the Lake Superior Consolidated Iron Mines, especially since with the Duluth and Iron Range Railroad it gave the Corporation a very effective control of ore transportation in the Mesabi region, not only with respect to its own production, but also to that of many of its competitors.

While, however, the railroad property was a valuable one, and while the Lake Superior Consolidated Iron Mines had very extensive ore reserves, as well as a considerable investment in mining improvements and equipment, the general evidence as to its organization and prices of its stock does not indicate a value for the company under competitive conditions at the time of its acquisition in excess of the par of its $29,424,594 stock outstanding. The subsequent value of the property, resulting from monopolistic control by the United States Steel Corporation of the Lake ore supply and the transportation thereof, is a very different matter. This question of merger value is referred to elsewhere. (See p. 326.)

The Bureau has, however, allowed in addition to the par value of the stock the surplus of the company on April 1, 1901. (See Table 12, p. 167.)

Section 14. Bessemer Steamship Company.

This was the leading ore vessel interest on the Great Lakes. It was a Rockefeller concern, and in this way was affiliated with the Lake Superior Consolidated Iron Mines, but the two corporations were distinct.

At the time of its acquisition by the United States Steel Corporation (May, 1901), the Bessemer Steamship Company owned 56 vessels, with a combined capacity of about 228,600 tons per trip. These were acquired on a cash basis by the Steel Corporation, the consideration being $8,500,000. As this price averages about $150,000 per vessel, or about $37 per ton of capacity, it seems probable that it was not greatly excessive, even though many of the vessels were old and comparatively small. (See pp. 194–197.)

Section 15. The Carnegie Company.

This company was incorporated under New Jersey laws in March, 1900, to merge under a single head all the various Carnegie properties, including the H. C. Frick Coke Company and its subsidiaries. It was capitalized as follows:

	Authorized and issued.
Bonds	$160,000,000
Stock	160,000,000

It is difficult to form a satisfactory estimate of the value of the properties of the Carnegie Company. There was no underwriting or promotion in the ordinary sense of the word, and the securities were not actively dealt in. In fact, no public sales of the stock were ever reported, except for a few scattered shares just about the time the company was acquired by the Steel Corporation. (See p. 171.) All of its securities were taken by the various individuals who had previously been indentified with the Carnegie and Frick concerns. It is impossible, therefore, to apply the same tests to this company that have been used in discussing the valuations of the other constituent concerns of the Steel Corporation.

It may, however, be noted that in the early part of 1899 W. H. Moore (the organizer of the American Tin Plate, National Steel, and several other steel companies), together with H. C. Frick and Henry Phipps, jr. (both partners of Mr. Carnegie), contemplated the purchase of the Carnegie and Frick properties and the transfer of these to a new corporation, and in accordance with this plan secured an option for the purchase of the old Carnegie Steel Company (Ltd.) on the basis of $250,000,000, and of the H. C. Frick Coke Company on the basis of $70,000,000, or a total of $320,000,000. It was reported that the prospective purchasers contemplated the organization of a company with no less than $675,000,000 capitalization. The deal fell through, however, the promoters paying Mr. Carnegie a cash forfeit of $1,170,000 for their option on his individual holdings in the Carnegie concern.

The failure of these negotiations, together with a disagreement over the terms of an alleged coke contract between the H. C. Frick Coke Company and the Carnegie Steel Company (Ltd.) resulted in very bitter feeling between Mr. Carnegie and Mr. Frick, which culminated in an attempt to eliminate the latter from the Carnegie concern, under an old partnership arrangement known as the "iron-clad agreement," which was designed to enable the controlling interest in the company to compel the resignation of any member whose connection was no longer desired. It was proposed to pay Mr. Frick for his interest in the Carnegie properties (which amounted to 6 per cent of the total) in cash. The book value of the old Carnegie company's properties on January 1, 1900, as officially determined at this time, was $75,610,104, this including about 30 per cent of the stock of the H. C. Frick Coke Company owned by the Carnegie Steel Company (Ltd.). On this basis, Mr. Frick's interest of 6 per cent was equivalent to $4,536,606.

Mr. Frick, however, was dissatisfied with this allotment and brought suit against Mr. Carnegie and his other partners to restrain them from carrying out their plans for eliminating him from the concern. Mr. Frick in his bill of complaint asserted that the book values of the various properties by no means represented their market values, as will be seen from the following excerpt from the bill:

> The books of said company do not now and have not recently contained a reasonable valuation of its assets. A very large quantity of its assets on the 1st day of January, 1900, stood upon its books at very inadequate valuations. Some of the assets did not there appear at any valuation. This was known to Carnegie and the other partners. The fair value of your orator's interest therein could not be determined from what now appears on the books of said company.

The answer of Mr. Carnegie and his associates to these contentions was, in part, as follows:

> These books show that the net value on the 31st day of December, 1899, of the assets of the Association was $75,610,104.96. To a large extent this book value represents the actual cost of the properties represented in the balance sheets of the Association. From time to time during the plaintiff's membership in the Association he, and other members, were appointed a committee to revalue certain assets. In every instance of such revaluation the plaintiff himself has been a member of such committee, and the values now entered and the properties included as having value may be taken as the plaintiff's own statement of their value to his fellow-members, on which, during the plaintiff's membership, more than fifteen settlements had been made with retiring members or the estates of deceased members.
>
> In the year 1892, and in anticipation of the dividend of profits which was then declared, the assets of the Association were carefully revalued and appraised by a committee consisting of H. C. Frick, H. M. Curry, and F. T. F. Lovejoy. Again, in the year 1899, at the suggestion of a committee consisting of H. C. Frick, Henry Phipps, jr., and F. T. F. Lovejoy, certain changes were made in the book value of the assets of the Association, and the result thus reached was a just, fair, and reasonable valuation of said assets, and was so accepted by the Association.
>
> Every month a balance sheet of the Association's assets and liabilities has been prepared, and a copy of the same furnished to the plaintiff, on which balance sheet the "book value" of the capital is clearly shown; and we aver that the valuation of the assets as shown on said books and balance sheets is a full, fair, and accurate valuation of the same, and that there has not been omitted from such books and balance sheets any asset which should properly find a place thereon.

* * * * * * *

> The method of valuing the interests of any member or members according to the valuation as stated on the books is eminently just and liberal. It is a method of ascertaining the value of partnership interests largely adopted both in this country and in England. The experience and judgment of business men justify us in saying (as we do) that such a method of valuation in large manufacturing companies, and especially of iron and steel in our country, as a rule, is more liberal to the seller than to the buyer; for experience has shown that partnership assets, on a just appraisement, seldom reach the value at which they stand on the books of the concern, and that a settlement made with a withdrawing partner, at a valuation of his interest based upon its value as appearing on the books of the firm, is, in a very large majority of cases, highly advantageous to such withdrawing partner.

Mr. Frick, in his bill of complaint, made the following statement:

> With the then outlook, Carnegie estimated in November, 1899, that it [the company] will realize from its business for the year 1900 a profit of $40,000,000, and I then and now believe that said profit will exceed $40,000,000. During the year ending December 31, its net profits were $21,000,000.
>
> Its assets on the 31st day of December, 1899, were clearly worth more than $250,000,000. Within the last few months Carnegie has asserted the fair value thereof to be greatly in excess of that sum. He has further asserted that they are of such value that in ordinary times of peace and reasonable business prosperity in England, the same could be readily placed in the London market on the basis £100,000,000. Since the making of these assertions the value of these assets has largely increased.
>
> Within the year 1899 huge additions to and improvements of the works have been completed, thereby adding enormously to their producing power. Other additions and improvements, now in course of construction, which will still further greatly increase said producing power and future profits, will soon be completed.

Mr. Carnegie's answer on the matter of the value of the property was a flat denial, as follows:

> *It is not true that on December 31, 1899, the said Association had assets or property, either real or personal or tangible, in any form, which the said Association in its legal capacity could transfer, which were worth $250,000,000; nor did the defendant, Andrew Carnegie, ever assert that said assets were in excess of that sum.*[1] The said Andrew Carnegie has repeatedly expressed the opinion with reference to the earning capacity of said company that the personnel of its organization was worth more than all the property of the company. It is true that the said Andrew Carnegie has expressed and still holds sanguine views as to the future of said company, but any such views are based upon the maintenance of the organization of the said company in its present condition of efficiency and harmony.

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[1] Italics by Bureau.

Statements thus submitted in litigation obviously must be used with discretion, but the positive and direct assertion of Mr. Carnegie that the Carnegie Steel Company (Ltd.) did not have assets or property in any form which it could legally transfer to the value of $250,000,000 is entitled to some weight. On the other hand, under the "ironclad agreement," above referred to, there may have been an inducement to keep the book values unduly low, so that this can not be accepted as necessarily a true indication of the property values; in fact, it is certain that some of the book values of investments were less than the true value. The intangible assets of the Carnegie concern, such as its organization and great earning power, were also important.

The valuation of such intangible considerations in the case of a successful company whose securities were not on the market is an extremely difficult matter. It is reasonably certain, however, that the value of the tangible property of the Carnegie Steel Company (Ltd.) and of the H. C. Frick Coke Company, taken together, was very much below the $320,000,000 of stock and bonds issued by the new Carnegie Company of New Jersey when it acquired these concerns.

ANALYSIS OF BALANCE SHEET OF CARNEGIE STEEL COMPANY (LTD.) ON MARCH 1, 1900.—Following is a copy of the balance sheet of the Carnegie Steel Company (Ltd.) on March 1, 1900, or just before the organization of the Carnegie Company of New Jersey was perfected, as given in J. Howard Bridge's "Inside History of the Carnegie Steel Company":

TABLE 10.—BALANCE SHEET OF THE CARNEGIE STEEL COMPANY (LTD.) ON MARCH 1, 1900.[1]

Assets.

Cash:		
Treasury	$1,287,437.66	
Works	19,283.43	
Sales agencies	25,302.50	
		$1,332,023.59
Bills receivable		7,174,804.02
Mortgages receivable, employees		239,845.44
Accounts receivable:		
Current	16,381,884.06	
Securities	517,324.80	
		16,899,208.86
Stocks:		
Finished product	2,755,203.92	
Materials for use	7,087,964.76	
Ore at Lake ports	1,952,212.31	
Ore at mines	16,470.00	
		11,811,850.99
Available assets		37,457,732.90

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[1] J. H. Bridge, "Inside History of the Carnegie Steel Company," page 313.

Works and properties:			
Edgar Thomson Works	$10, 429, 594. 67		
Duquesne Steel Works	2, 333, 406. 35		
Duquesne Furnaces	5, 626, 211. 91		
Homestead Steel Works	16, 644, 201. 84		
Carrie Furnaces	1, 079, 588. 69		
Howard Axle Works	717, 476. 87		
Lucy Furnaces	1, 251, 869. 99		
Keystone Bridge Works	718, 160. 11		
Upper Union Mills	1, 000, 000. 00		
Lower Union Mills	700, 000. 00		
Larimer Coke Works	200, 000. 00		
Youghiogheny Coke Works	160, 000. 00		
City farm lots	960, 664. 50		
Verona land	40, 000. 00		
Liberty farm	225, 000. 00		
Oliver land	310, 313. 81		
Fawcett land	25. 00		
		$42, 396, 513. 74	
1900 improvements:			
Edgar Thomson Furnaces	50, 489. 13		
Edgar Thomson Steel Works	31, 441. 69		
Edgar Thomson Foundry	10. 50		
Duquesne Furnaces	13, 324. 48		
Duquesne Steel Works	304, 635. 24		
Homestead Steel Works	240, 666. 98		
Carrie Furnaces	204, 070. 56		
Howard Axle Works	102, 542. 90		
Lucy Furnaces	3, 415. 57		
Keystone Bridge Works	1, 663. 18		
Upper Union Mills	6, 537. 12		
Lower Union Mills			
		958, 797. 35	
Stocks and bonds, investments		14, 940, 405. 50	
			$58, 295, 716. 59
Undivided capital		77, 710. 72	
Due from partners		5, 585, 642. 22	
			5, 663, 352. 94
Total assets			101, 416, 802. 43

Liabilities.

Mortgages payable:		
Edgar Thomson Works	$209, 945. 00	
Duquesne Steel Works	995, 000. 00	
Duquesne Furnaces	200, 000. 00	
Homestead Steel Works	103, 250. 00	
Carrie Furnaces	600, 000. 00	
Howard Axle Works	273, 275. 85	
Keystone Bridge Works	50, 000. 00	
Liberty farm	150, 000. 00	
Oliver land	153, 000. 00	
		$2, 734, 470. 85
Bills payable:		
Current	4, 360, 174. 73	
Stewart	375, 000. 00	
Berntraeger	271, 423. 56	
		5, 006, 598. 29
Accounts payable:		
Current	2, 469, 650. 44	
Ore	240, 130. 21	
		2, 709, 780. 65
Special deposits		3, 776, 276. 27
Liabilities payable		14, 227, 126. 06

Special funds:			
Contingent fund	$557, 143. 50		
Contingent, special	711, 810. 00		
Relining fund	211, 328. 85		
Coal extinguishment fund	15, 822. 45		
		$1, 496, 104. 80	
Due to partners		4, 113, 657. 38	
Surplus	56, 579, 914. 19		
Capital	25, 000, 000. 00		
		81, 579, 914. 19	
			$101, 416, 802. 43

It is possible in a general way to analyze some of the principal items in this balance sheet.

Current assets.—Including the amounts due from partners and the " undivided capital," these current assets aggregated $43,121,086. Against this total, however, should be placed the current liabilities (including the amounts due to partners), aggregating $15,606,313, thus leaving the net working assets at $27,514,773.[1]

Manufacturing plants.—The manufacturing plants—that is, " works and properties "—it will be seen, were entered on the balance sheet at $42,396,513.74, or, including improvements up to the 1st of March, 1900, of $958,797.35, at a total valuation of $43,355,311.09. This item represents chiefly blast furnaces, steel works, and other manufacturing plants, with the plant sites, and also includes some miscellaneous land and some coke property.

This book valuation of the manufacturing properties may be accepted as a fair current valuation at the time. These properties, as already shown, had been revalued on various occasions by the Carnegie interests. It is true that the plant sites, as claimed elsewhere (see note, p. 158), may have appreciated considerably, and that possibly the full amount of this appreciation was not shown. A very rough comparison of capacities and valuations for the Carnegie, Federal Steel, and National Steel companies, however, indicates that the book valuation of the manufacturing properties of the former must have been reasonably near a fair current valuation.

Investments.—The only other significant item of assets, as entered on the balance sheet, is that of investments, which, it will be seen, amounted to $14,940,405.50. This item is the most difficult of any to criticize intelligently. It included the holdings of the Carnegie Steel Company (Ltd.) in the H. C. Frick Coke Company, the Oliver Iron Mining Company, the Pittsburg Steamship Company, the Carnegie Natural Gas Company, the Union Railroad Company, the Pittsburg, Bessemer and Lake Erie Railroad Company, and some minor investments.

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[1] It is possible that some of the items under " Special funds " in the preceding balance sheet should be deducted from the gross current assets, but since the exact nature of these is not known this has not been done, but instead a deduction for all these funds and the mortgages is later made. (See p. 159.)

The Carnegie Steel Company (Ltd.) held a 29.552 per cent interest in the stock of the H. C. Frick Coke Company, the par value of which amounted to $2,955,200, but which was carried on the books of the Carnegie Steel Company (Ltd.) at $5,110,042; this, as shown elsewhere (see note, p. 158), was the book value, representing the actual cost plus its proportion of undivided surplus. On the basis of such a valuation for a 29.552 per cent interest, the entire book value of the H. C. Frick Coke Company's stock would have been $17,291,696.

There can be no doubt, however, that the real value of this H. C. Frick Coke property was greatly in excess of the book value. The company, in March, 1900, had approximately 40,000 acres of coking-coal land, the value of which at the time probably ranged anywhere from $750 to $1,000 per acre. It also had 11,000 coke ovens, which may be reckoned as worth from $6,000,000 to $7,500,000. The company also owned several subsidiary concerns, chiefly water or transportation companies. The aggregate value of these miscellaneous investments, however, could not have been very great. Without attempting any detailed valuation of the Frick Coke properties, it is probably safe to say that at a conservative valuation they were worth in March, 1900, from $40,000,000 to $50,000,000. James J. Campbell, the former auditor and secretary of the Carnegie Company, in an affidavit submitted in litigation against the Steel Corporation in 1902 (see p. 158), stated that the 30 per cent interest of the Carnegie Steel Company (Ltd.) in the H. C. Frick Coke Company was "considered to be worth more than $20,000,000" in March, 1900. On this basis the entire value of the Frick concern would have been at least $66,667,000. However, Mr. Campbell's estimate, since it was submitted in defense of the Steel Corporation's capitalization, was likely to exaggerate a fair market valuation, and it seems that an estimate of $50,000,000 for the Frick property would be much nearer the mark and probably high.

Another important investment was that in the Oliver Iron Mining Company, of which the Carnegie Steel Company (Ltd.) held $1,000,000 capital stock, out of a total of $1,200,000. This stock, according to the affidavit by James J. Campbell, above referred to, was carried on the books of the Carnegie concern at $2,167,000, this sum representing the original investment plus accumulations of profit, but after allowing for outstanding indebtedness. This sum undoubtedly was less than a fair valuation of the Carnegie company's interest in the Oliver Iron Mining Company. While the valuation of the ore property of the Steel Corporation can best be considered as a whole instead of by parcels, it may be noted here in passing that the remaining one-sixth interest in the Oliver Iron Mining Company which had been held by the Oliver & Snyder Steel Company was valued in 1897 by the owners, in an option submitted to the promoters of a $75,000,000 wire consolidation then in contemplation, at $1,400,000. If that was a fair price for that fraction, it would indicate a value for the entire property, at that time, of $8,400,000, on which basis the five-sixths interest held by the Carnegie Steel Company (Ltd.) would have been worth $7,000,000. In view of the fact that this option was submitted to promoters who were organizing a consolidation, it is fair to assume that the vendors named a price which they considered liberal. On the other hand, the value of ore property in 1897 would not be a fair criterion of the value of the same property in 1900. Moreover, during this interval the Oliver Iron Mining Company had added materially to its holdings of ore, so that for this reason also the price named on this one-sixth interest in 1897 can not be regarded as conclusive.

It may further be noted that this one-sixth interest in the Oliver Iron Mining Company, together with a one-sixth interest in the Pittsburg Steamship Company, was sold in 1901 for $9,250,000 of United States Steel preferred stock and a like amount of United States Steel common stock. As shown elsewhere (p. 196), the cash value of the one-sixth interest in the Pittsburg Steamship Company in April, 1901, may be estimated as worth about $625,000, the book investment in the fleet on that date being $3,783,000. Assuming that the United States Steel common stock issued in this transaction was a mere bonus, and that the $9,250,000 of preferred stock represented the full cash value of the ore property and the steamship property combined, this would indicate a cash price of $8,625,000 for the one-sixth interest in the ore property alone. On the basis of such a valuation the five-sixths interests held by the Carnegie Steel Company (Ltd.) would have been worth $43,125,000, and the entire property $51,750,000. Such a valuation, however, is certainly excessive. The United States Steel Corporation was anxious to get control of this ore company, and the price which it was willing to pay for a small fraction of the stock under these conditions might be an even more unsafe criterion than the option price on this same one-sixth interest given four years earlier.

In view of the difficulties of estimating the ore property by parcels, the Bureau, as already stated, has undertaken a valuation of the ore property of the Steel Corporation as a whole. This is done in Chapter III. No attempt is made to place a definite valuation upon the ore property of the Carnegie company by itself.

The Union Railroad Company, which was carried on the books of the old Carnegie company at $2,290,000, was probably worth considerably more than that sum (see p. 193), and the book valuation assigned the Carnegie Natural Gas Company, namely, $1,500,000, was probably low.[1]

The valuations at which the other investments of the Carnegie Steel Company (Ltd.) were carried on its books are not known. The most important of these were 110,010 shares (par value $5,500,500) of the common stock and 10,000 shares (par value $500,000) of the preferred stock of the Pittsburg, Bessemer and Lake Erie Railroad Company, a five-sixth interest in the Pittsburg Steamship Company, the entire stock of the Pittsburg and Conneaut Dock Company, and a one-half interest in the Pewabic company, owning the Pewabic mine. There can be no doubt that a fair valuation of the stock of the Pittsburg, Bessemer and Lake Erie Railroad Company in March, 1900, would be considerably less than the par value of the shares. Even allowing the full par value, however, the Carnegie company's investment in that stock would have been worth only about $6,000,000.

The Pittsburg Steamship Company in March, 1900, had 6 steamers and 1 barge, some of which were old and of small capacity. It had under construction, however, 5 new and large steamers. The book investment in these vessels on March 1, 1900, was $2,385,947. On this basis, the five-sixths interest of the Carnegie Steel Company (Ltd.) would be worth, roughly, $2,000,000.

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[1] Excerpts from Mr. Campbell's affidavit (submitted in July, 1902), referred to on page 156, concerning these properties, follow:

> For example the Carnegie Steel Company (Ltd.) then [early in 1900] owned $1,000,000 par value out of the total par value of $1,200,000 of the Oliver Iron Mining Company, which was entered on the books of the Carnegie Steel Company (Ltd.) at $2,167,000 corresponding to the net book value of the properties as they appeared on the books of the Oliver Iron Mining Company itself. The book value of these ore properties represented the cost of acquiring the same and accumulations of profit. The Oliver Iron Mining Company owned Bessemer and other iron-ore properties of enormous value, which had been acquired at a very low cost and before the great value of the Lake Superior Bessemer ores was known. Some of these ore properties, which were acquired at a nominal cost, are now worth one hundred fold such cost.
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> The 30 per cent interest in the H. C. Frick Coke Company was carried on the books of the Carnegie Steel Company (Ltd.) at $5,110,042, which was based not on the actual value of the properties themselves but on the book value, which represented cost and undivided surplus, but most of such properties were purchased many years before at a small or nominal price per acre, and prior to the discovery of the great value of the Connellsville coal for coking purposes. The 30 per cent interest of the Carnegie Steel Company (Ltd.) in the H. C. Frick Coke Company was considered to be worth more than $20,000,000 at the time it was acquired by the Carnegie Company of New Jersey, in March, 1900, and could not then, in my opinion, at the market value of the same coal fields, have been replaced or duplicated at any such figure. The stock of the Carnegie Natural Gas Company, which was carried on the books of the Carnegie Steel Company (Ltd.) at $1,500,000, was then and is now worth many times that amount. The stock of the Union Railroad Company, which was carried on the books at $2,290,000, was worth in my opinion at least $10,000,000.
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> * * * * * * *
>
> The mills and plants, such as the Edgar Thomson Works, the Homestead Steel Works, the Duquesne Steel Works, the Duquesne Furnaces, and other works, were all entered at their original cost and included nothing for large amounts expended on the same to improve and modernize them, which expenditures were made out of current earnings of the company and were charged off against its profit and loss account, but which materially increased not only the intrinsic values of the plants by many million dollars, but their earning capacity. [See, however, the additions to such properties in the balance sheet on page 154.] Moreover, the valuations contained in the books comprehended large tracts of real estate at the actual cost thereof, some of which had been acquired twenty-five or thirty years prior thereto at a small figure and had appreciated enormously in value. These properties are exceptionally situated by reason of their proximity to coke fields, to manufacturing and distributing centers, and to economical facilities for railroad and river navigation.

As shown later, the Steel Corporation was at this time endeavoring to justify its huge capitalization so that there was a great temptation before its officers to make their estimates of its property liberal.

The investment in the Pittsburg and Conneaut Dock Company was approximately $1,200,000.

On the foregoing basis the indicated value of the Carnegie and Frick properties, other than their ore and natural-gas property, would be approximately as follows:

Assets other than "investments" (book value):	
Working capital	$27, 500, 000
Manufacturing properties	43, 350, 000
Union Railroad Company (see text)	2, 290, 000
Pittsburg Steamship Company (five-sixths interest)	2, 000, 000
Pittsburg and Conneaut Dock Company	1, 200, 000
"Investments" exclusive of ore and natural-gas property (estimated value):	
H. C. Frick Coke Company (entire property)	50, 000, 000
Pittsburg, Bessemer and Lake Erie Railroad (52 per cent interest)	6, 000, 000

The total of these various items is $132,340,000, but after deducting the mortgages of $2,734,471 and the special funds of $1,496,105 shown in the balance sheet on pages 154–155, the net total would be approximately $128,100,000.[1]

All of the above valuations are probably sufficiently liberal, with the exception of that for the Union Railroad Company, the actual value of which stock probably considerably exceeded its book value. Allowing as much as $4,000,000 additional to cover this item, there would be left, roughly, $28,000,000 of bonds and all of the $160,000,000 stock of the Carnegie Company to cover its ore and natural-gas property and a few unimportant remaining items, and intangible considerations. The valuations of the ore and natural-gas properties are taken up in the next chapter.

The Carnegie ore properties were almost entirely leaseholds, which have, of course, as a rule, a lower value than fee property. The ore tonnage on these properties was very much less than that of the Lake Superior Consolidated Iron Mines.

These figures, while arbitrary in many respects, certainly suggest that the tangible property of the Carnegie Company of New Jersey was not much, if at all, in excess of the $160,000,000 bond issue, and that the $160,000,000 stock was issued for earning power and other intangible considerations.

It may be noted that in the agreement providing for the organization of the New Jersey company it was stated that the various

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[1] As shown on page 80, there was a considerable amount of underlying indebtedness, largely of railroad concerns. This need not be considered here, however, as the valuations placed on the stocks of such roads allow for such indebtedness.

Carnegie Steel properties would receive $125,000,000 in bonds of the new concern and a like amount in its stock,[1] and the H. C. Frick Coke properties $35,000,000 in bonds and $35,000,000 in stock. This arrangement, in view of the usual method at that time of giving common stock as a bonus with preferred issues, certainly gives some color to the suggestion that the bonds may have been regarded as similar to preferred stock and intended to cover the physical property and that the stock was issued to cover earning power and other intangible considerations.

There can be no question that the earning power of the properties, as distinguished from the value of the tangible assets, figured very largely in the capitalization of the New Jersey concern. As shown above (p. 152), the answer of Mr. Carnegie and his associates in the H. C. Frick suit stated that Mr. Carnegie had repeatedly expressed the opinion that the personnel of the organization was worth more than all of its property. In this connection the following further excerpt from the answer may be cited:

> The profits which have resulted do not represent simply earnings or interest on the capital invested, but have been the product from year to year of the brains, intelligence, and industry of the several members who, in their separate departments, have so conducted the business of the association as to produce this profit. Any capitalization of the earning power of the enterprise as a going concern would in no wise represent only the value of the plant and other property which are the assets of the Association, and to which alone upon his withdrawal, retirement, or exclusion from the Association the plaintiff is entitled to an account. Such capitalization would be based upon the continued operation of the plant by the members, upon whose future earning power the plaintiff has no lien or claim.

Earnings of the Carnegie properties in 1899.—The earnings of the principal Carnegie properties for the years 1896–1900, as given by J. H. Bridge, in his book upon the "Inside History of the Carnegie Steel Company," were as follows:

TABLE 11.—NET PROFITS OF CARNEGIE STEEL COMPANY (LTD.), 1896–1900.[2]

Year.	Net profits.[3]	Year.	Net profits.[3]
1896	$6,000,000	1899	$21,000,000
1897	7,000,000	1900	40,000,000
1898	11,500,000		

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[1] This may have covered the Carnegie Steel Company's interest in the H. C. Frick Coke Company.

[2] Bridge, "The Inside History of the Carnegie Steel Company," page 295.

[3] Mr. Bridge in his book referred to $4,500,000 as additional profits reinvested, but it was not clear whether this applied to the year 1900 or to a longer period.

The earnings of the company for 1899, it will be seen, were $21,000,000, this amount including $1,253,853 (or 29.552 per cent) of the earnings of the H. C. Frick Coke Company. The total profit of the Frick concern, therefore, was $4,242,870. Including these total earnings, the entire profit of both the Carnegie and Frick concerns for the year was $23,989,017. This would be equivalent to only 7.5 per cent on a capitalization of $320,000,000. To capitalize a great iron and steel concern on a basis of 7.5 per cent would be suggestive of overvaluation in any instance. When it is considered that the year 1899 was one of exceptional prosperity in the iron and steel industry, such overvaluation is the more apparent. It is true that in 1900 the earnings of the Carnegie and Frick properties combined were nearly $40,000,000, or at the rate of about 12½ per cent on a total capitalization of $320,000,000. The year 1900, however, while not quite so remarkable with respect to the high prices of products as 1899, was a phenomenally prosperous year for the Carnegie Company, and the earnings afford no satisfactory basis for judging the value of the property.

The earnings of some of the other large iron and steel companies for the year 1899, and the ratio of those earnings to capitalization, were as follows:

Company.	Issued securities, Dec. 31, 1899.[1]	Earnings 1899 before deducting bond interest.[2]	Per cent.
Federal Steel	$126,345,000	$9,371,136	7.4
National Steel	62,000,000	8,930,000	14.4
American Steel and Wire	90,000,000	12,162,530	13.5
National Tube	80,000,000	13,878,365	17.3

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[1] Including underlying bonds but not other indebtedness.

[2] In two cases the earnings are not for the exact calendar year; thus the fiscal year of the National Steel Company ended February 28, 1900, and that of the National Tube Company ended June 30, 1900.

From this table it appears that the earnings of the Federal Steel Company in 1899, before deducting bond interest, were equivalent to 7.4 per cent on its total outstanding capitalization (stock and bonds).. This was substantially the same rate as that indicated by comparing the earnings of the Carnegie and Frick concerns, in the same year, with the subsequent capitalization of $320,000,000. Moreover, the earnings of the other three companies—National Steel Company, American Steel and Wire Company, and the National Tube Company—show a higher rate on their total capitalization than do even the enormous earnings of the Carnegie Company for the year 1900. In view of the preceding evidence that the capitalization of these three concerns was very greatly in excess of their actual investment, the fact that they still showed higher rates of earnings than the Carnegie Company in its exceptionally prosperous year may be fairly presented as confirming other evidence that the capitalization of the Carnegie Company was excessive.

Further evidence tending to the same conclusion is shown in the following table, which gives the capacity of finished products of the Carnegie, the Federal Steel, and the National Steel companies, and the amount of securities per ton of capacity in 1900:

Company.	Issued securities, Dec. 31, 1900.	Capacity of finished steel products.	Securities per ton capacity.
		Tons.	
Carnegie	[1] $336,600,000	3,200,000	$105
Federal Steel	126,345,000	2,300,000	55
National Steel	62,000,000	2,000,000	31

[1] Including underlying bonds of approximately $16,000,000; in this comparison purchase-money obligations are not included.

It should be noted that these figures of capitalization and capacity, as well as those of earnings given in the preceding table, are not strictly comparable for the reason that the Carnegie Company had a larger investment, relatively as well as absolutely, in coal and miscellaneous properties than most of the other concerns. However, the Federal Steel Company had very extensive ore property and also very important railroad properties, while its holdings of coal and coke were important. It has already been shown that the capitalization of that concern was very greatly in excess of the value of its investment in tangible property at its organization; and allowing for additions through surplus earnings up to the close of 1900 there can be no doubt that there was still a considerable excess of securities over the investment in tangible property. Including such overcapitalization, however, the average per ton of capacity for the Federal Steel Company was only $55, whereas the average for the Carnegie Company was, in round numbers, $105 per ton. The average for the National Steel Company, it will be seen, was only $31 per ton, but this is not so fairly comparable as that of the Federal Steel Company. However, the fact that these two heavily capitalized concerns show average capitalizations per ton of capacity very much below the per ton average for the Carnegie Company tends to confirm other evidence of extensive overcapitalization by the latter concern.

Excessive price paid for Carnegie Company by Steel Corporation.—For $159,450,000 of bonds and $160,000,000 of stock of the

Carnegie Company, the United States Steel Corporation issued $492,000,000 of its securities, as follows:

For $159,450,000 of Carnegie Company bonds	bonds	$159,450,000
For $96,000,000 of Carnegie Company stock	do	144,000,000
For $64,000,000 of Carnegie Company stock	preferred stock	98,277,120
	common stock	90,279,040
Total		[1]492,006,160

There can be no possible doubt that this enormous issue of securities by the Steel Corporation to acquire the securities of the Carnegie Company meant heavy overvaluation. Of course, the United States Steel Corporation, in buying the Carnegie Company, paid not only for tangible assets, but also—and very liberally—for earning power, and, perhaps more important still, for the elimination of Mr. Carnegie. However, even on the basis of earning power, the price paid for the Carnegie Company's securities was excessive. As just shown, the earnings of the Carnegie Company in the year 1900 were about $40,000,000. This compares with combined earnings of all the Carnegie and Frick concerns in 1899 of about $24,000,000, which in turn were greatly in excess of the earnings of any previous year. Earnings of even $40,000,000, however, represent only a little over 8 per cent on the total amount of securities issued ($492,006,160) by the Steel Corporation for the Carnegie concern. The average earnings of the Carnegie and Frick properties in 1899 and 1900 were about $32,000,000. This average amount would be equivalent to 6½ per cent on the total amount of securities issued for the company. The year 1899, as just stated, was a phenomenally prosperous one in the steel industry, and 1900, despite some reaction, was by far the most prosperous year ever enjoyed by the Carnegie concern up to that time. To capitalize a steel business on the earnings of two abnormally prosperous years on a 6 or even an 8 per cent basis obviously means heavy overvaluation judged by any reasonable standard.

That the purchase price of the Carnegie Company involved a heavy overissue of Steel Corporation securities is evident from a comparison of this price with prices paid for stocks of the Federal Steel Company and the National Steel Company, which companies, it will be remembered, were in the same general class as the Carnegie Company, since they were well integrated and since they were chiefly concerned with the manufacture of the cruder and heavier classes of steel products. The amounts of United States Steel securities, par value, issued in the acquisition of the securities of these three companies were as follows:

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[1] Apparently $1,200,000 cash was also paid for the Carnegie concern. This, however, has been treated as a part of the expenses of the underwriting syndicate. (See note, p. 174.)

	Total U. S. Steel securities issued in acquisition.
Carnegie Company	[1] $492,006, 160
Federal Steel Company	110, 415, 546
National Steel Company	73, 702, 500

In other words, the Steel Corporation issued about 4½ times as much in its securities, at par value, for the Carnegie Company as it did for the Federal Steel Company, and nearly 7 times as much as it did for the National Steel Company. This, however, does not fairly state the case, because, as just shown, more than one-half the purchase price of the Carnegie Company was in bonds, which were worth much more than Steel Corporation stocks, whereas no bonds were issued for the stocks of the Federal Steel and National Steel companies. Based upon the market values of the securities issued, the price for the Carnegie Company was about 6 times as great as that for the Federal Steel Company and about 9 times as great as that for the National Steel Company.

It should be pointed out that the property of the Carnegie Company was acquired subject to underlying indebtedness, approximating $24,850,000 (including purchase-money obligations, etc.), and that the stock of the Federal Steel Company was preceded by nearly $27,150,000 of underlying indebtedness, and that of the National Steel Company by about $6,000,000. It will be seen, therefore, that the property of the Federal Steel Company was subject to a greater underlying indebtedness, both relatively and actually, than was that of the Carnegie concern.

However, it is incredible that the Carnegie Company was worth to the Steel Corporation 6 times as much or even 4½ times as much as the Federal Steel Company (even after allowing for the underlying debt in each case), except on the sole ground that the Corporation thus acquired what would have been its most dangerous competitor. In other words, this price was the price of peace. The capacity of the steel works, blast furnaces, etc., of the Carnegie Company was only about 40 to 50 per cent greater than that of the Federal Steel Company. It is true that the Carnegie Company had very much larger holdings of coal and coke property and possibly as large holdings of iron-ore lands as the Federal Steel Company. Even at high valuations for these coke and ore properties, however, it would be absurd to argue that the Carnegie Company was worth 6 times or even 4½ times as much as the Federal Steel Company. The United States Steel Corporation, of course, in making these acquisitions considered earning power and other intangible considerations, and on this basis might have been justified in paying a much greater price for the Carnegie Company than for the Federal Steel Company relative to the tangible assets. As just shown, however, the earnings of the Carnegie Company, great as they were, were far from sufficient to justify any such huge price as was actually paid for that concern.

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[1] Of this total $303,450,000 was in United States Steel bonds. (See note 2, p. 174.)

In the case of the National Steel Company the capacity of the steel works, blast furnaces, etc., was only about two-thirds that of the Carnegie Company, while the National Steel Company's investment in ore and coke properties was relatively unimportant as compared with the very valuable properties of this sort owned by the Carnegie Company. Nevertheless, it is incredible that the Carnegie Company was worth 9 or even 7 times as much as the National Steel Company (again taking underlying indebtedness into account).

It should be kept in mind also that the Steel Corporation issued its securities for the stocks of the Federal Steel and National Steel companies themselves on a very liberal basis. Thus, the Steel Corporation issued more than $110,000,000 of its stocks for the stocks of the Federal Steel Company, whereas the equity represented by the latter at the organization of the Federal Steel Company in 1898, as already shown, did not exceed $63,000,000. Allowing for the surplus earnings accumulated by the company up to April 1, 1901 (roughly, $18,150,000), and also allowing for intangible considerations, the price paid by the United States Steel Corporation in its securities must be regarded as high.

In the same way, in the case of the National Steel Company, the value of its stock undoubtedly was very much less than the par value of the United States Steel stocks issued therefor, namely, $73,702,500. The foregoing comparison of the relative amounts of securities issued for the three companies, therefore, by no means tends to show the full extent of the overvaluation of the Carnegie property, but simply shows that, judged by even this imperfect standard, the amount of that overvaluation must have been very great.

The conclusion is inevitable, therefore, that the price paid for the Carnegie Company was largely determined by fear on the part of the organizers of the Steel Corporation of the competition of that concern. Mr. Carnegie's name in the steel industry had long been synonymous with aggressive competition, and there can be little doubt that the huge price paid for the Carnegie concern was, in considerable measure, for the specific purpose of eliminating a troublesome competitor, and Mr. Carnegie personally in particular. This, it may be noted, was the interpretation generally placed upon the transaction in trade and financial circles at the time.

Section 16. Summary of evidence as to value of property of constituent concerns of the United States Steel Corporation.

From the discussion of the organization of the principal constituent companies of the United States Steel Corporation given in this chapter, it is apparent that most, if not all, of these concerns issued securities greatly in excess of the value of the tangible properties which they acquired at the dates of their respective organizations. In the case of those companies having both preferred and common stock, the evidence in general indicates that the preferred stock alone covered practically all the tangible property, and that the common stock represented nothing but earning power and other intangible considerations and mere "water." Moreover, in some cases, especially that of the American Sheet Steel Company, there is ground for the view that even the preferred stock was not fully protected by tangible property values. In the case of the Federal Steel Company, on the other hand, the available evidence indicates that the common stock was partly covered by physical property, although a large proportion of the common stock issue of this concern appears to have been issued against earning power, or as a mere bonus. In the case of the Lake Superior Consolidated Iron Mines, which had no preferred stock, there originally appeared to have been a heavy overissue of common stock and the book valuation of the property in 1901 seems to have been high. The Carnegie Company presents a more difficult problem, but here there is at least a fair presumption that the physical property did not exceed the $160,000,000 of bonded indebtedness. The intangible considerations in the case of this concern, however, were unusually important, although, even including these, the evidence presented indicates that the total capitalization of $320,000,000 involved very great overvaluation.

It is obviously impossible to present any statement of the property values of these constituent concerns by this method which can be regarded as exact or conclusive. A rough summary may, however, be made on the basis of the valuations tentatively arrived at in the preceding section. This is done in Table 12.

TABLE 12.—ESTIMATED VALUE OF TANGIBLE ASSETS OF STEEL CORPORATION ON APRIL 1, 1901, BY CONSTITUENT COMPANIES.

Constituent concern.	Date of organization.	Estimated values of tangible assets (over underlying indebtedness) at date of organization.	Surplus, Apr. 1, 1901.	Total tangible assets (over underlying indebtedness) Apr. 1, 1901.	Underlying bonds, purchase-money obligations, etc.	Total value of tangible property on Apr. 1, 1901.
Carnegie Company (New Jersey)	1900	$160,000,000	$37,563,000	$197,563,000	$25,392,000	$222,955,000
Federal Steel Company	1898	63,000,000	18,147,000	81,147,000	27,139,000	108,286,000
American Steel and Wire Company (New Jersey)	1899	40,000,000	13,162,000	53,162,000	6,055,000	59,217,000
National Tube Company	1899	40,000,000	27,485,000	67,485,000		67,485,000
National Steel Company	1899	27,000,000	6,909,000	33,909,000	5,989,000	39,898,000
American Tin Plate Company	1898	18,325,000	6,178,000	24,503,000	190,000	24,693,000
American Steel Hoop Company	1899	14,000,000	1,661,000	15,661,000		15,661,000
American Sheet Steel Company	1900	17,000,000	706,000	17,706,000	2,000,000	19,706,000
American Bridge Company	1900	[1] 31,374,000	4,030,000	35,404,000	157,000	35,561,000
Lake Superior Consolidated Iron Mines		[1] 29,400,000	2,095,000	31,495,000	5,542,000	37,037,000
Shelby Steel Tube Company		[1] 3,000,000	[3] *209,000*	2,791,000		2,791,000
Bessemer Steamship Company					8,500,000	8,500,000
One-sixth interest in Pittsburg Steamship Company and Oliver Iron Mining Company		[2] 9,250,000		9,250,000		9,250,000
Total		452,349,000	[4] 117,727,000	570,076,000	[5] 80,964,000	651,040,000
Cash capital provided at organization of Steel Corporation						25,003,000
Approximate grand total of value of tangible property on Apr. 1, 1901.						676,043,000

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[1] Estimated value of property at time of its acquisition by the United States Steel Corporation (except surplus) instead of at its organization, but shown in this column for convenience in statement.

[2] Amount of preferred stock of United States Steel Corporation issued therefor; this probably excessive, but allowed here in absence of other data.

[3] Deficit.

[4] The surplus here given is the total surplus on March 31, 1901 (after certain adjustments made by the Steel Corporation). It is assumed that all of this surplus was accumulated by the constituent concerns subsequent to the dates of their respective organizations, since in most, if not in all, cases they commenced business without any surplus. The American Bridge Company, the Lake Superior Consolidated Iron Mines, the Bessemer Steamship Company, the Shelby Steel Tube Company, and the one-sixth interest in the Oliver Iron Mining Company and the Pittsburg Steamship Company were acquired subsequent to April 1, 1901.

[5] About $60,000,000 of this total was outstanding at the time the various companies were organized.

From this table, therefore, it appears that the value of the tangible property of these constituent concerns (at the dates of their respective organizations, except in certain cases, as noted) was $452,349,000, this being the amount over and above underlying indebtedness of approximately $60,000,000, thus making a grand total at that time of $512,349,000. This may fairly be considered as the total investment of these concerns at these respective dates. Adding to this their surplus earnings of $117,727,000 accumulated during the period up to April 1, 1901, and again including the underlying indebtedness (which had increased to $80,964,000), as representing an equivalent investment, gives the total investment of these concerns in tangible property on April 1, 1901, of $651,040,000. Adding to this the $25,003,000 new cash capital provided, gives a final total of tangible assets for the Steel Corporation on April 1, 1901, of $676,043,000.

Aside from additions to the investment of these concerns through the accumulated surplus earnings, it is possible that their properties, even after allowing for depreciation, were worth somewhat more in 1901 than they were when those constituent companies were organized. In the case of manufacturing plants, the cost of construction in this interval undoubtedly had increased somewhat. However, it is known that some of these concerns did not write off sufficient amounts for depreciation of their plants. Furthermore, it would be very unsafe to regard such appreciation in plant valuations, as distinct from additions through expenditure of new capital, as of a permanent character, since so far as it existed at all it was undoubtedly a reflection of the unusual prosperity which prevailed in the steel industry during a considerable portion of this period. Still again, any such appreciation in current valuations of physical properties was probably due, in part, to the concentration of control of the industry into the hands of comparatively few concerns, with the consequent restriction of competition. This is especially true in the case of the natural resources. The values of these natural resources are extensively discussed in the next chapter and need not be taken up here.

Taken by themselves, it will be seen that these figures indicate an aggregate investment in the various constituent concerns, plus $25,000,000 new working capital, of, roughly, $676,000,000, or less than one-half the total securities of the Steel Corporation issued to acquire them (including underlying bonds in each case). It should be remembered that this total of $676,000,000 is not presented as the market value of these properties in 1901, but as the value at the dates of organization of the various constituent concerns plus the subsequent investment in them up to April 1, 1901. Furthermore, the estimate is, as already stated, a tentative one. Before arriving at final conclusions as to the relation between assets and capitalization of the Steel Corporation, the valuation of its property will be taken up by other methods.

In short, the facts presented in this table are not a final conclusion; they are but evidence, to be considered with further evidence presented later, a view from but one side, which must be combined with views from other sides before any final conclusion can be drawn.

Section 17. Comparison of capitalization of Steel Corporation with market value of securities acquired.

The indicated investment in the constituent concerns of the Steel Corporation, arrived at by historical analysis of the organization of these concerns and of their earnings, in the preceding sections of this chapter, may now be compared with the market value of the securities of these various companies. In this connection it should be noted that such stock-market values (leaving out of consideration temporary factors) obviously include an allowance for earning power present and prospective, and other intangible considerations, and thus represent the value of the various companies as going concerns, whereas the valuations given in Table 12 virtually were for the tangible assets only.

The securities of several of the constituent concerns were dealt in on the New York Stock Exchange in fairly large volume, so that these market prices must be regarded as a fair reflection of the current public estimate of the value of these properties as going concerns. In the case of two companies, however—the Carnegie Company and the Lake Superior Consolidated Iron Mines—the securities were not listed on any exchange and were not dealt in in sufficient volume to make market prices a reliable indication of the public estimate of the value of these concerns. It is possible, however, to arrive at results sufficiently accurate for the comparisons here made; in any event, the figures used are sufficiently liberal. Table 13 has therefore been compiled, showing the average market valuation in 1899 and 1900 of the securities of the various companies acquired by the Steel Corporation in 1901, based upon weekly quotations, where such quotations are available.

TABLE 13.—APPROXIMATE MARKET VALUATION OF SECURITIES ACQUIRED BY UNITED STATES STEEL CORPORATION IN 1901, AS INDICATED BY AVERAGE MARKET PRICES, 1899–1900.

Constituent concern.	Amount of stock acquired by United States Steel Corporation.	Average market price of stock in 1899–1900.	Value at average price.
Stocks regularly quoted:			
Federal Steel Company—	*Par value.*	*Per cent of par value.*	
Preferred	$53,260,200	76.38	$40,680,141
Common	46,483,700	50.04	23,260,443
American Steel and Wire Company—			
Preferred	39,999,000	89.41	35,763,106
Common	49,981,400	48.26	24,121,024
National Tube Company—			
Preferred	40,000,000	94.20	37,680,000
Common	40,000,000	48.72	19,488,000
National Steel Company—			
Preferred	26,996,000	91.16	24,609,554
Common	31,970,000	41.67	13,321,899
American Tin Plate Company—			
Preferred	18,325,000	84.77	15,534,103
Common	28,000,000	34.77	9,735,600
American Steel Hoop Company—			
Preferred	14,000,000	77.34	10,827,600
Common	19,000,000	32.11	6,100,900
American Bridge Company [1]—			
Preferred	31,357,600	93.10	29,193,926
Common	30,946,400	43.88	13,579,280
Shelby Steel Tube Company [1]—			
Preferred	4,776,100	56.48	2,697,541
Common	8,018,200	10.90	873,984
Stocks not actively quoted:			
American Sheet Steel Company [1]—			
Preferred	24,499,600	[2] 65.88	16,140,336
Common	24,499,600	[2] 19.00	4,654,924
Lake Superior Consolidated Iron Mines	29,413,905	[2] [3] 75.00	22,060,429
Carnegie Company—			
Bonds	159,450,000	105.00	167,422,500
Stock	160,000,000	[4] 100.00	160,000,000
Oliver Iron Mining Company, one-sixth interest	200,000	....	[5] 9,250,000
Pittsburg Steamship Company, one-sixth interest	221,700		
Total	[6] 881,398,405	....	686,995,290
Mortgages and purchase-money obligations	....	....	21,872,023
Underlying bonds and scrip at par	....	....	59,091,657
Cash capital	....	....	[7] 25,003,000
Grand total	....	....	792,961,970

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[1] No quotation in 1899.

[2] Mean of highest and lowest prices in Pittsburg market in 1900, weekly quotations not being available.

[3] Asked price in 1900. Does not include lower prices recorded in 1900.

[4] Only 13 shares known to have been sold in open market.

[5] Not based on stock quotations but amount of United States Steel Corporation preferred stock issued therefor at par.

[6] Does not include $535,407 unacquired stock in constituent and subsidiary concerns.

[7] Including $3,000 paid in by original incorporators.

For the first eight companies in Table 13, a satisfactory record of quotations was in most cases readily available. It may be noted that several of these companies were not organized until late in 1899 or early in 1900. In such cases quotations were used from the earliest date on which they were available to the close of 1900.

In the case of the Lake Superior Consolidated Iron Mines, the price used, $75 per share, is the highest reported in 1899 and 1900. In the early part of 1899 the stock was quoted certainly as low as $40 a share and the highest in that year appears to have been about $60. The highest in 1900 appears to have been, as just stated, $75 per share. The maximum quotation has been used rather than an average, since, on account of the inactivity of the stock and of the fact that it had never paid a dividend, the lower quotations mentioned may not be representative of a fair valuation.

The stocks of the American Sheet Steel Company were inactive. The prices here given appear to be the best available indication of their market value.

The bonds of the Carnegie Company were quoted in 1900 at about 105, and occasional sales were reported at this figure.[1] In the case of the stock, there appear to have been no recorded transactions in 1900. In the early part of February, 1901, a very few shares of this stock sold in the Pittsburg market at $1,000 per share, the par value.[2] Since at this time it was known that negotiations for the purchase of the Carnegie concern had been undertaken by the banking interests who later organized the United States Steel Corporation, this price must be considered as probably an overstatement of the real market value of the stock.[3]

While such infrequent transactions as were recorded for the stocks of the Lake Superior Consolidated Iron Mines, the American Sheet Steel Company, and the Carnegie Company obviously are unsatis-

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[1] The total reported sales of Carnegie Company bonds in the Pittsburg market in 1900, were as follows:

Date.	Amount sold.	Series.	Price (per cent of par).
November 12	$1,000	D	105
November 14	2,000	D	105
November 15	61,000	D	105
November 17	5,000	D	105
November 19	6,000	D	105
November 20	7,000	D	* 105
November 21	$156,000	D	* 105
November 22	11,000	D	* 105
November 27	1,000	D	* 105
December 3	10,000	D	105
Total	260,000	....	....

* And accrued interest.

[2] As noted in the text, there were no recorded sales of the stock of the company in 1900. The recorded sales of the stock in 1901 amounted to 13 shares, and each share brought $1,000. The sales were effected on the following dates: February 5, 3 shares; February 7, 7 shares; February 8, 3 shares.

[3] After the terms of purchase of the Carnegie Company were known, some sales of the stock were apparently made to the syndicate on a cash basis at $1,500; obviously, however, such prices must be ruled out of consideration here.

factory, nevertheless they have been used in the table as being the best available indication of the value placed upon these stocks in actual transfers.

The valuation of the securities included in the table has been obtained by multiplying the average per cent of the par values of each security by the amount of that security acquired in April, 1901, this including practically the entire amount outstanding; there were few changes of any consequence in the outstanding amounts of stock of these companies from the dates of their organization up to the time of their absorption by the Steel Corporation. Any such increases were so small that it can not be assumed that the market prices of the securities would have been different had they been made at an earlier date. It is entirely proper, therefore, to use these amounts of stock in connection with the market prices of 1899 and 1900.

No quotations were obtainable for the stocks of the Oliver Iron Mining Company or the Pittsburg Steamship Company. The one-sixth interest in these two concerns has arbitrarily been placed at the par value of the preferred stock of the United States Steel Corporation issued therefor, as was done in Table 12, on uage 167.

In addition to the cash and securities above enumerated, the United States Steel Corporation purchased the vessels of the Bessemer Steamship Company. This acquisition is included in the item of $21,872,023 of mortgages and purchase-money obligations.

Therefore, this computation of market values, which, in the case of a few companies, is admittedly unsatisfactory—due to the lack of sufficiently frequent quotations—suggests a market valuation for the various securities acquired by the United States Steel Corporation of, roughly, $687,000,000. In order to permit of comparison with the total capitalization and with the estimate of the value of the physical properties arrived at by historical analysis, as given on page 167, there should be added $25,003,000 to cover the cash capital provided for the Corporation, $21,872,023 for mortgages and purchase-money obligations, and $59,091,657 to cover underlying bonds and scrip at par (market quotations not being available). The addition of these amounts gives a total indicated market valuation of $793,000,000.[1]

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[1] These average weekly market prices do not include prices for the first three months of 1901, or just preceding the organization of the Steel Corporation. This period has been excluded for the reason that during a considerable part of these three months quotations of these steel stocks were directly influenced by the pending organization of the Steel Corporation. It is true that in January, 1901, there was a rather severe break in the prices of some of these steel securities, but this was succeeded by an almost sensational advance, due to the prospect that these companies would be merged on terms very favorable to the old stockholders. Since the year 1899, as already shown, was one of phenomenal prosperity in the iron and steel trade, and the year 1900, despite a severe setback, one of distinct prosperity, it is altogether fair, in arriving at an average market valuation, to exclude from consideration the abnormal quotations reached in the early part of 1901, as a result of the prospect of a merger of these great consolidations into a single corporation. In other words, the high prices recorded for some of these securities just prior to the organization of the United States Steel Corporation can not be regarded

This market valuation of $793,000,000 exceeds the estimate arrived at in the preceding section of $676,000,000 by $117,000,000. This difference is more than accounted for by the fact that whereas in Table 12 only the physical property of the Carnegie Company was considered, this being placed at $197,563,000 (including the surplus of $37,563,000), in Table 13 an estimate of the value of the intangible considerations is included, making the total for the Carnegie Company, roughly, $327,400,000.

The stock-market valuation represents the values of these properties as going concerns, including prospective values, and thus allows for intangible considerations and not merely for the tangible property. Therefore, it is altogether natural that such stock-market valuations should exceed the value of the physical property alone, and especially as the period covered was on the whole one of prosperity in the industry. Indeed, a much larger excess of market valuation over the tangible-property valuation than is here shown would be entirely normal, assuming the value of tangible property to be correct. In fact, it will be observed that if the additional value here given the Carnegie Company were eliminated ($129,855,900), the resultant total valuation by this method would be less than the valuation of $676,000,000 arrived at in the preceding section for tangible assets only. If all of the market quotations were entirely satisfactory, this result might warrant scaling down the previous estimate of the tangible properties. Since, however, these market quotations are in some cases admittedly unsatisfactory and since, moreover, the Bureau desires to present the results obtained by each different method (see p. 116) on their own respective merits, no such reduction in the previous estimates for the tangible property need be considered at this time. As already noted, the estimates of the Bureau obtained by the various methods employed are brought together and summarized in Chapter IV.

Section 18. Comparison of prices paid by United States Steel Corporation for securities of constituent concerns with average market prices of the latter.

The great excess of securities issued by the United States Steel Corporation over the aggregate of securities which it acquired has already been clearly brought out, both by the total figures and by the terms of exchange given in Table 4, on page 113. A comparison of these rates of exchange with the average market values of the

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as a fair indication of the value of these companies, but rather as an expression of the value of monopolistic power, or, at least, of concentrated power, which was anticipated from the still greater merger.

However, had the average market prices for the three months from January 1, 1901, to April 1, 1901, been included with the average prices for the two preceding years, the aggregate market valuation of the securities (including cash and underlying bonds at par) would have been only about $799,000,000, or not materially different from the total obtained by using the average prices of 1899 and 1900.

constituent stocks in 1899 and 1900, as shown in Table 13, is given in the following table:

TABLE 14.—COMPARISON OF RATES OF EXCHANGE OF UNITED STATES STEEL STOCKS FOR STOCKS OF CONSTITUENT CONCERNS, WITH AVERAGE MARKET VALUES OF LATTER IN 1899 AND 1900.

Constituent concern.	Average market price of stock in 1899-1900.	Received in United States Steel securities per $100 of old par value.		
		Preferred stock.	Common stock.	Bonds.
Carnegie Company:				
Bonds	105.00			100.00
Stock, 60 per cent	[1] 100.00			150.00
Stock, 40 per cent	[1] 100.00	[2] 153.50	[2] 141.00	
Federal Steel Company:				
Preferred	76.38	110.00		
Common	50.04	4.00	107.50	
American Steel and Wire Company:				
Preferred	89.41	117.50		
Common	48.26		102.50	
National Tube Company:				
Preferred	94.20	125.00		
Common	48.72	8.80	125.00	
National Steel Company:				
Preferred	91.16	125.00		
Common	41.67		125.00	
American Tin Plate Company:				
Preferred	84.77	125.00		
Common	34.77	20.00	125.00	
American Steel Hoop Company:				
Preferred	77.34	100.00		
Common	32.11		100.00	
American Bridge Company: [3]				
Preferred	93.10	110.00		
Common	43.88		105.00	
Shelby Steel Tube Company: [3]				
Preferred	56.48	37.50		
Common	10.90		25.00	
American Sheet Steel Company: [3]				
Preferred	[4] 65.88	100.00		
Common	[4] 19.00		100.00	
Lake Superior Consolidated Iron Mines: Common	[5] 75.00	135.00	135.00	

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[1] Only 13 shares known to have been sold in open market. (See note 2 on page 171.)

[2] In the case of the Carnegie Company the rates of exchange were not officially stated, and apparently they were not the same for all holders. The actual amounts of United States Steel securities used by the underwriting syndicate (not directly by the Corporation) to acquire the securities of the Carnegie Company were, however, stated in the preliminary report of the Corporation, as follows:

> The syndicate acquired 60 per cent ($96,000,000) of the stock of the Carnegie Company and $159,450,000, face value, of the 5 per cent bonds of the Carnegie Company by delivering to the holders thereof said $303,450,000 of bonds of this Corporation and $1,200,000 in cash; and the syndicate acquired the remaining 40 per cent ($64,000,000) of the stock of the Carnegie Company by delivering to the holders thereof 982,771 shares of preferred stock and 902,790 shares of common stock of this Corporation.

The deduction from the total of bonds issued, namely, $303,450,000, of $159,450,000, to represent Carnegie bonds (exchanged at par) leaves a balance of $144,000,000, which was issued for $96,000,000 of Carnegie stock, thus indicating a rate of $150 in bonds for each $100 in stock. Presumably these exceptionally favorable terms were secured chiefly by Mr. Carnegie, who held just about 60 per cent of the Carnegie Company's stock.

It is not certain whether the $1,200,000 cash was used to buy preferred stock or bonds. Including the cash, the ratio would be slightly higher.

For the remaining 40 per cent of the stock of the Carnegie Company the amounts given in the above excerpt from the annual report averaged $153.50 in new preferred and $141 in new common for every $100 of this Carnegie stock. The syndicate apparently offered in most cases 150 in United States Steel preferred and 150 in United States Steel common stock; but varied the terms in other instances.

[3] No quotations in 1899.

[4] Mean of highest and lowest prices in Pittsburg market in 1900, weekly quotations not being available.

[5] Asked price in 1900. Does not include lower prices recorded in 1900.

It will be seen from this table that in every case, except the Shelby Steel Tube Company, the amounts of stock issued by the Steel Corporation were in excess of the average market values of the corresponding stocks acquired, and usually very greatly in excess. The overissue of securities in the case of the Carnegie Company has been sufficiently discussed and need not be referred to in detail here. For each share of the preferred stock of the Federal Steel Company, the average market value of which in 1899 and 1900 was $76.40 per share, the Steel Corporation issued $110 in its preferred stock. Corresponding figures in the case of the American Steel and Wire Company preferred were, roughly, $89.40 and $117.50. The highest rates of exchange with respect to preferred stocks, it will be seen, were accorded the American Tin Plate Company, the National Tube Company, and the National Steel Company.[1] It is worth pointing out that no preferred stock of a constituent concern, with the single exception of the Shelby Steel Tube (which was acquired at a subsequent date), received less than its par value in United States Steel preferred.

The overissue of common stock of the Steel Corporation was even more marked. With the single exception of the Shelby Steel Tube none of the common stocks of the constituent companies received less than its par value in common stock of the Steel Corporation, while several of them received well over the par value in new common and in several cases an additional issue of preferred stock of the Steel Corporation as well. A conspicuous instance of this was in the case of the American Tin Plate Company, the common stock of which received $125 in new common for each $100 common of the old, and in addition $20 in new preferred.

The exceptionally favorable terms accorded the Lake Superior Consolidated Iron Mines, namely, $135 in new preferred and $135 in new common stock for each $100 of old stock, are worthy of special notice. The Lake Superior Consolidated Iron Mines, as already pointed out, was owned by Standard Oil interests and was acquired after most of the larger steel companies included in the list. Owing to the fact that this company not only had very extensive ore reserves but also an important ore railroad, and more especially to its exceptionally strong financial backing, it was practically in a position to dictate its own terms, and apparently did so.

In view of this great increase of capitalization by the Steel Corporation, it is worth repeating that this followed very heavy inflation of securities in the organization of nearly all of the constituent concerns, while in some cases the latter in turn had issued their securities at very much in excess of those which they in turn had acquired. As a conspicuous illustration, the inflation of capitalization by the wire combinations may be noted. Thus, each $100 stock of the Consolidated Steel and Wire Company, organized in 1892, received in 1898 $175 in preferred stock and $175 in common stock of the American Steel and Wire Company of Illinois, or $350 of new securities for every $100 of old. A few months later each $100 of the preferred stock of the American Steel and Wire Company of Illinois received $100 in preferred stock and $60 in common stock of the American Steel and Wire Company of New Jersey, while each $100 of the Illinois concern's common stock received $120 in common stock of the New Jersey concern. Thus, each $100 stock of the old Consolidated company became $490 in the stock of the New Jersey concern. In the final merger of the latter company into the Steel Corporation each $100 par value of the preferred stock received $117.50 in preferred stock of the Steel Corporation, while each $100 (par value) of the common stock received $102.50 in United States Steel common stock. In other words, every $100 par of the stock of the Consolidated Steel and Wire Company was finally transmuted into $528.50 par of Steel Corporation securities. This is perhaps the most striking instance of repeated increase of securities afforded in the history of the Steel Corporation, but the increase in many other cases was also very great.

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[1] In this connection it should be stated that the organizers of the Steel Corporation allotted a solid block of stock for the "Moore" companies and that the suballotment of that stock by companies and by different classes of stock was made by the dominating interests in this group and not by the organizers of the Corporation. (See Exhibit 4, p. 396.)

Of course, the value of these properties may have increased greatly in this interval, so that it should not be understood that the entire amount of the increase represented nothing but "water."

The evidence in this chapter shows that whatever the actual value of the securities acquired by the Steel Corporation may have been it was very much less than the par value of the United States Steel securities issued therefor. The extent of such overvaluation is discussed in Chapter IV, where the estimates of the value of the property given in this chapter are summarized in connection with those obtained by another method.

Section 19. Large amounts of securities issued by constituent concerns for promotion services.

A very striking illustration of the inflation of securities by these various consolidations, and one which may fairly be considered in judging the general relationship of their capitalization to investment, is afforded by the large payments made for promotion and underwriting services. Such payments, which are over and above the usual bonus in common stock given with preferred for an equivalent amount of cash or property, aggregate for seven of the concerns above described, no less than $63,300,000 stock, this including in one instance about $850,000 of preferred. These figures, moreover, do not include any allowance for the American Sheet Steel Company, which almost certainly made payments of the same sort, or for the Shelby Steel Tube Company. The facts regarding such payments or commissions, which have already been briefly referred to in the preceding discussion, may here be summarized.

Federal Steel Company.—As shown on page 118, the underwriting syndicate of the Federal Steel Company was to provide $14,075,000 cash (this including $200,000 for organization expenses). The syndicate, however, secured most of this cash from the stockholders of the constituent concerns of the Federal Steel Company in the manner already described, so that the actual amount of cash raised by the syndicate, as such (as distinct from any amounts which syndicate members may have subscribed as stockholders in the acquired concerns), was apparently but $4,823,373. In return for this cash payment and its services the syndicate received a residue of Federal Steel stocks amounting, at par, to about $5,680,565 preferred and $8,422,992 common. Assuming that for the cash provided the syndicate received 100 per cent in preferred and a bonus of 100 per cent in common, there would be left, roughly, $850,000 of Federal Steel preferred and $3,600,000 Federal Steel common stock, which may be regarded as the compensation of the syndicate for its services and profit as distinct from any payment for the new cash capital provided, as follows:

	Preferred stock.	Common stock.
Stock received by syndicate	$5,680,565	[1]$8,422,992
Amount allowed to cover cash raised by syndicate	4,823,373	4,823,373
Balance to cover "services" of syndicate	857,192	3,599,619

[1] Includes $3,000 incorporators' stock.

While, however, the syndicate commission in the case of this company apparently included a small amount of preferred stock, it will be recalled that the common stock of the company had some tangible property back of it at the start.

American Steel and Wire Company of New Jersey.—As shown on page 132, at the organization of this company a syndicate raised $28,000,000 of cash, for which it received $28,000,000 of preferred stock and $28,400,000 of common stock, or the entire issues of each class over and above the amounts paid for the old American Steel and Wire Company of Illinois. Subscribers to the syndicate received with each $100 preferred stock paid for at par a bonus of $60 in common stock, or in the aggregate $16,800,000. This left a balance of $11,600,000 of common stock unaccounted for, as shown below:

	Preferred stock.	Common stock.
Total amount issued to the syndicate	$28,000,000	$28,400,000
Paid syndicate subscribers for $28,000,000 of cash	28,000,000	16,800,000
Balance	....	11,600,000

This residue of $11,600,000—which, it will be seen, is entirely distinct from the common-stock bonus paid in connection with cash subscriptions to preferred stock—went to those who managed the organization of the company as their compensation or commission.

American Tin Plate Company.—Testimony before the Industrial Commission (see p. 135) showed that $10,000,000 of the common stock of this company went to the organizers as their compensation, this being over and above the $18,000,000 of common stock issued as a bonus with the preferred stock for property and cash. It is possible that not all of this $10,000,000 commission was retained by the promoters, since they had to meet certain expenses of organization—usually small—and, moreover, it is possible that in some cases the promoters offered certain of the concerns entering the consolidation a special bonus in common stock in order to secure such concerns. Such special allowances may have reduced the net amount of the commission.

National Steel Company.—It appears from the testimony before the Industrial Commission (see p. 137) that $5,000,000 of the common stock was issued for the "expenses of organization"; in other words, that it went to the promoters for their services and expenses.

American Steel Hoop Company.—In the case of this concern also it appears that at least $5,000,000 of common stock was retained by the organizers as their commission. (See p. 139.)

American Sheet Steel Company.—As already stated the exact facts concerning the promotion of this company are not obtainable. However, the evidence (see p. 140) indicates that the properties and cash acquired by this company probably did not exceed $16,000,000 (although the Bureau has allowed $17,000,000), for which apparently $16,000,000 preferred and $16,000,000 common stock were issued, so that possibly there is ground for the assumption that the remaining issued amounts of each class of stock may have been retained by the promoters as their compensation. This can not, however, be stated as a definite fact. Therefore, nothing has been included for that company in this computation.

National Tube Company.—In the promotion of this company it appears that $20,000,000 of the $40,000,000 common stock issued was given as a bonus with the $40,000,000 of preferred stock in payment for properties or for cash. The remaining $20,000,000 of common stock apparently went to the organizers as a commission, although a part of this may have been distributed by them to banking interests as commissions for assisting in raising cash capital.

American Bridge Company.—In the case of this concern the exact amount of stock issued as a commission is somewhat uncertain, owing to somewhat unusual methods of financing. It seems, however, that at least $7,250,000 of the common stock represented such a commission, and possibly a larger sum.

Shelby Steel Tube Company.—In the case of the Shelby Steel Tube Company, as shown in note 1, page 144, $1.305,900 of the common stock was allotted for organization expenses. Just how much of it represented a commission is not known, and as the total amount is small in comparison with the other payments here discussed it has been omitted.

Carnegie Company.—In the organization of the Carnegie Company no promoters or bankers were employed and apparently no stock was issued for commissions.

Lake Superior Consolidated Iron Mines.—The Bureau secured no information as to whether any of the stock of this concern was issued to the promoters, and it has been assumed that despite the heavy overcapitalization of the company at the time of its organization no stock was issued for this particular purpose. The company, it will be recalled, was organized in 1893.

The total of these various commissions, not including anything for either the American Sheet Steel Company or the Shelby Steel Tube Company, was $63,306,811, as follows:

Table 15.—AMOUNTS OF STOCK ISSUED BY CONSTITUENT CONCERNS OF STEEL CORPORATION FOR COMMISSIONS TO PROMOTERS (EXCLUSIVE OF BONUS STOCK ISSUED FOR PROPERTIES OR FOR CASH).

Company.	Common stock "commission."	Company.	Common stock "commission."
Federal Steel	[1] $4,456,811	National Tube	$20,000,000
American Steel and Wire	11,600,000	American Bridge	7,250,000
American Tin Plate	10,000,000	Total	[2] 63,306,811
National Steel	5,000,000		
American Steel Hoop	5,000,000		

[1] Includes $857,192 of preferred stock.

[2] No amounts are here entered for the American Sheet Steel Company, for reasons given in the text, nor is anything entered in the case of the Shelby Steel Tube Company.

It should once more be stated that this total does not include the large amounts of common stock of these constituent companies issued as a mere bonus with preferred stock for property or cash. Out of the commissions above described the promoters sometimes had to meet certain expenses, but in general such expenses were small, and these commissions, or the proceeds realized therefrom, represented the compensation of the promoters and organizers.

CHAPTER III.

VALUATION OF TANGIBLE PROPERTY OF THE STEEL CORPORATION IN 1901 BY DEPARTMENTS OF ITS BUSINESS.

Section 1. Introductory.

In the preceding chapter the value of the property of the United States Steel Corporation at the date of its organization has been discussed by the first and second methods outlined on page 116, namely, by historical study of the organization and investment of the constituent concerns, and by the computation of the market values of the securities of these concerns. It now remains to discuss the value of the tangible property of the Corporation by the third method referred to, namely, by departments of its business. Such a valuation is taken up in the present chapter. With reference to the properties other than ore, this discussion is in part a summary and reclassification of facts brought out in Chapter II. The valuation of the ore property is approached by several different methods, and, on account of its importance, is given a separate division of the chapter.

Section 2. Estimate filed by the Corporation in the Hodge suit in 1902.

In undertaking the valuation of the properties of the Corporation by departments of its business for 1901, it will be found convenient to refer to an estimate of the physical assets made by officials of the Steel Corporation themselves in their defense of the so-called "Hodge suit." This suit was brought in 1902 to prevent the company from issuing $200,000,000 of bonds to retire a like amount of preferred stock. The laws of New Jersey required a certificate from officers of the Corporation to the effect that its assets were equal to the preferred stock, after allowing for indebtedness, as a prerequisite to such conversion of any part of the preferred stock into bonds. One of the main points raised by the plaintiffs in this suit was that the Corporation did not thus possess assets equal to the amount of its preferred stock, after allowing for prior indebtedness.

In reply to the charge of deficiency of assets in this particular, an estimate of the physical properties of the Corporation was filed by Charles M. Schwab, then its president, these valuations being subscribed to by several other prominent officials of the Corporation.

This estimate, which classified the property by the principal departments of the business, follows:

TABLE 16.—ESTIMATE OF VALUE OF TANGIBLE ASSETS OF UNITED STATES STEEL CORPORATION ON JULY 1, 1902, SUBMITTED BY THE CORPORATION IN THE HODGE SUIT.

Ore properties	$700, 000, 000
Plants, mills, fixtures, machinery, equipment, tools, and real estate	300, 000, 000
Blast furnaces	48, 000, 000
Coal and coke	100, 000, 000
Transportation properties	[1] 80, 000, 000
Natural gas fields	20, 000, 000
Limestone properties	4, 000, 000
Cash and cash assets	[2] 148, 291, 000
Total	1, 400, 291, 000

[1] President Schwab stated that the Corporation's estimate for this item was the value after allowing for $40,340,000 of indebtedness. (See note, p. 197.)

[2] As of June 1, 1902. (See note 3 to Table 23, p. 234.)

Except in the case of the transportation properties, where, as noted, the valuation of $80,000,000 was the estimated valuation after allowing for indebtedness, the figures here given represent the Corporation's estimate of the entire value of the different classes of property without respect to the securities issued against them; that is to say, they do not represent merely the equity value in these properties for the stockholders of the Corporation over and above bonded indebtedness. The valuations arrived at by the Bureau in this chapter likewise are for the total tangible property, without respect to the securities outstanding against it. In comparing its figures with those of the Corporation, the Bureau has restored the indebtedness of railroad companies which was deducted by the Corporation's officials.

The main purpose of this chapter is to arrive at as accurate a valuation of the properties of the Steel Corporation as is possible, rather than to discuss at length the above estimate of the Steel Corporation. It is, however, desirable to consider this estimate of the Corporation in connection with the following analysis by the Bureau; an especial advantage in this method of treatment is that the figures in the Corporation's estimate can be regarded as invariably fixing maximum limits of valuation. The estimate of the Corporation in connection with the Hodge suit was submitted at a time when there was a powerful motive before its officers to overvalue its assets. It is apparent that after placing liberal valuations upon all the property other than ore the officers making this estimate credited the ore with an amount sufficient to bring the Corporation's total assets up to more than the total of its outstanding securities. As shown later, this valuation for the ore was very excessive.

It should be kept in mind that this estimate by the Corporation was made in July, 1902. By that time the property of the Corporation had been increased through surplus earnings and also, to a small extent, by capital raised or property acquired through the issue of additional securities, so that the total investment was somewhat greater than it was in April, 1901. If a precise comparison of the Bureau's estimate with these estimates of the Corporation was desired, with a view to carefully reconciling differences between them, it would be necessary to determine how this additional investment was distributed among the different departments of the Corporation's business. For the present purpose this is not necessary. It should, however, be kept in mind that the valuations of the Bureau in this chapter are applicable as of the date of the company's organization on April 1, 1901, while those of the Corporation, above given, were made in July, 1902.

Mr. Schwab, in his affidavit in behalf of the Corporation, said:

> The foregoing items of valuation do not include any allowance for the value of the good will and established businesses of the various plants and properties, nor do they include anything for the very valuable patents, trade-marks, and processes owned or controlled, or anything for the large amount of orders for manufactured goods which have been actually received and are in process of filling.

In other words, Mr. Schwab claimed very emphatically that the Corporation's estimate did not include an allowance for intangible considerations, so that comparison may properly be made with the Bureau's figures later presented, which are for tangible property only.

I. VALUE OF PROPERTIES OTHER THAN ORE.

Section 3. Value of manufacturing plants, and connected real estate.

The manufacturing plants of the Steel Corporation (including real estate for plant sites, etc.) other than coke properties and blast furnaces, were entered in the Corporation's 1902 estimate at $300,000,000, and the blast furnaces at $48,000,000, making a total for what may be called the iron and steel works proper, and real estate for plant sites, of $348,000,000.

From the facts given in Chapter II, it is possible to present an independent estimate for these manufacturing properties as they were in April, 1901. Thus, in the case of the Federal Steel Company, the steel works, blast furnaces, and similar equipment were those of the Illinois Steel Company and of the Lorain Steel Company (and the Johnson Company), since the Minnesota Iron Company and other subsidiary concerns of the Federal company had no property of this character. The real estate and manufacturing plants of the Illinois Steel Company were entered in its balance sheet of June 30, 1898, at approximately $20,200,000. (See p. 121.) Since that balance sheet stated separately the investment of the company in railroad stocks, coke properties, and current assets, this book figure may be taken as the investment in steel works, blast furnaces and similar plants, and real estate at that date. As shown in Chapter II, there is good reason for the opinion that all of the book valuations of the company were sufficiently liberal.[1]

The properties of the Lorain and Johnson companies at the time of their acquisition by the Federal Steel Company, it will be recalled, were valued at approximately $4,000,000. This entire amount may be credited to manufacturing plants.

The manufacturing properties and blast furnaces of the Carnegie Steel Company (Ltd.) at the organization of the Carnegie Company of New Jersey, in March, 1900, may be taken, as previously shown (see p. 155), at the book value of $43,355,000.

In the case of the other constituent concerns, the values of the manufacturing plants can not thus be directly taken from balance sheets. However, as already shown in Chapter II, in the case of nearly all these other companies the value of the entire property did not exceed their respective issues of preferred stock, and, moreover, such property at the dates of their organization consisted of only two general classes, namely, manufacturing plants and working capital. The working capital is known in practically every instance, so that by deducting this from the amount of preferred stock issued in each respective case there is obtained an approximate valuation of the manufacturing plants. Thus, in the case of the American Steel and Wire Company the value of all the tangible assets was placed at $40,000,000 (see p. 131), the amount of preferred stock issued. The company had $16,600,000 net working assets, leaving $23,400,000 as substantially the value of the plants.

The total value of the tangible assets of the American Tin Plate Company (see p. 136) at its organization was approximately $18,000,000, the amount of preferred stock originally issued, to which should be added $325,000 subsequently issued at par to acquire the plant of the Canonsburg Iron and Steel Company. The company started with about $4,500,000 of working capital. The difference of $13,825,000, therefore, substantially represents the value of the manufacturing plants.

In the case of the National Steel Company, the value of the property at the time of its organization—over and above $2,561,000 of bonded indebtedness later allowed for—has been placed (see p. 137) at $27,000,000, the amount of preferred stock issued (this including $1,000,000 issued some time after the company's organization). The company had $9,000,000 of current assets, thus leaving $18,000,000 to cover the remaining property. This entire amount has been credited to the manufacturing properties of the company, since its other fixed properties were not of sufficient importance to necessitate an allotment of this balance.

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[1] The Illinois Steel Company had a small amount of ore lands, but apparently this was not included in the figure just given. At any rate, any allowance for ore property included in that figure would be so small that no deduction need be made for it here.

A similar method of computation in the case of the American Steel Hoop Company indicates that the value of the manufacturing plants was the difference between $14,000,000, the total amount of preferred stock issued, and the original working capital, $3,000,000, or a total of $11,000,000. This valuation for the manufacturing plants is probably too liberal, for reasons already shown.

The valuation of the National Tube Company's manufacturing plants may likewise be arrived at by deducting from $40,000,000, the estimated total value of all its assets (as expressed by the par value of the preferred stock), the $16,000,000 of net current assets with which the company commenced business, the company having practically no other kind of property at its organization. This leaves $24,000,000 for the manufacturing properties.

The property of the American Bridge Company likewise consisted almost exclusively of manufacturing plants and current assets. The combined value of both has been taken at the par value of the preferred stock issued, $31,374,000 (this including some stock issued subsequent to the formation of the company). Since the company had $11,500,000 of working capital at the start, $19,874,000 is left for the manufacturing plants.

In the case of the American Sheet Steel Company, it will be recalled (see p. 140) that the tangible assets of every description were not equal to the amount of preferred stock issued, and that the manufacturing plants apparently had been valued for purposes of consolidation at $12,000,000. From the evidence already given, it is clear that such a valuation is sufficiently large. An addition of $1,000,000 has, however, been made to cover certain detached real estate.[1]

The plants of the Shelby Steel Tube Company at the time of the acquisition of that concern by the United States Steel Corporation had suffered heavy depreciation. As shown in Table 4, on page 113, the Steel Corporation issued, roughly, $1,800,000 of its preferred stock and $2,000,000 of its common stock in exchange for the preferred and common stock of the Shelby Steel Tube Company which it acquired (this being the great bulk of the entire issue in each case). The market value of United States Steel stock thus issued was about $2,800,000, which would indicate a market valuation for the entire Shelby Steel Tube property of, roughly, $3,000,000. An allowance of

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[1] The company also had natural-gas property valued at about $2,000,000. This has been considered as offsetting the $2,000,000 bonded debt of the company, and this latter item, therefore, does not require consideration here. The natural-gas property is valued later. (See p. 200.)

$2,500,000 to cover the manufacturing properties alone might be considered reasonable, but since the entire amount is so small these manufacturing properties have been credited in the Bureau's estimate with a value of $3,000,000.[1]

The Lake Superior Consolidated Iron Mines had no manufacturing plants. Its railroad and ore properties, like those of the other subsidiary concerns, are discussed elsewhere in this chapter.

The one-sixth interest in the Pittsburg Steamship Company and in the Oliver Iron Mining Company likewise need not be considered here, since neither of these concerns had any manufacturing properties.

It should be observed that in the case of a few of these concerns the valuations arrived at by the Bureau represent the equity in the property over and above certain bonded indebtedness. Thus, the valuation of $18,000,000 for the manufacturing properties of the National Steel Company represents the stockholders' equity in this property, after allowing for $2,561,000 of outstanding bonds. A few of the other subsidiary manufacturing companies likewise had small amounts of underlying indebtedness. In an estimate of the value of the manufacturing properties as distinct from the stockholders' equity therein, an amount equivalent to such indebtedness should be added, since it may be assumed that such bonds represent a corresponding investment in the property. The total addition on this account is $3,000,000. In the case of the American Sheet Steel Company there were $2,000,000 of underlying bonds, but these, as already noted, have been considered as representing an equivalent investment in natural-gas property rather than in manufacturing plants; therefore no addition on this account need be made at this point.

The Illinois Steel Company also had a large issue of bonds, most of which presumably were issued against manufacturing properties, and a considerable part of the large issue of the Carnegie Company may be considered as having been issued against such properties. In the case of these companies, however, the bonded indebtedness need not be considered, since the valuations above given were the full valuations as shown in the balance sheets, and not merely an expression of the stockholders' equity therein.

The other subsidiary manufacturing companies of the Steel Corporation had no bonded indebtedness at their organization. In a few cases additional bonds were subsequently issued or assumed, particularly by the American Steel and Wire Company and the National Steel Company, but since practically all of the added investment represented by such increase in indebtedness was incurred in the purchase of property other than manufacturing plants—principally steamships, ore, and coke—such additional issues may be disregarded in this discussion of the value of the manufacturing plants proper.

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[1] The use of the market value of the securities issued by the Steel Corporation as a criterion for judging the value of the property acquired is as a rule incorrect, particularly at the time of merging various competing concerns (see p. 210), but in this instance, owing to the sharp reduction in capitalization and to the comparatively small amount involved, it is justifiable.

Except in the cases noted, none of these companies increased their stock issues up to the time they were absorbed by the United States Steel Corporation.

On the basis of the foregoing discussion, the values of the steel works, blast furnaces, and similar manufacturing properties (including real estate) of the companies acquired by the United States Steel Corporation *at the dates of their respective organizations* were substantially as follows:

TABLE 17.—BUREAU'S ESTIMATE OF INVESTMENT OF CONSTITUENT COMPANIES OF UNITED STATES STEEL CORPORATION IN MANUFACTURING PLANTS (INCLUDING BLAST FURNACES) AND REAL ESTATE AT THE DATES OF THEIR RESPECTIVE ORGANIZATIONS.

Company.	Preferred stock issued.	Current assets at organization.	Balance to represent plants.
American Steel and Wire Company	$40,000,000	$16,600,000	$23,400,000
National Steel Company[1]	27,000,000	9,000,000	18,000,000
American Tin Plate Company[1]	18,325,000	4,500,000	13,825,000
American Steel Hoop Company	14,000,000	3,000,000	11,000,000
National Tube Company	40,000,000	16,000,000	24,000,000
American Bridge Company[1]	31,374,000	11,500,000	19,874,000
Other companies:			
Carnegie Company (book value)			43,355,000
Federal Steel Company—			
Illinois Steel Company (book value)			20,200,000
Lorain and Johnson companies (approximate cash price)			4,000,000
Shelby Steel Tube Company (approximate cash price)			3,000,000
American Sheet Steel Company (estimated)			13,000,000
Add to cover investment in manufacturing plants represented by miscellaneous bonds			3,000,000
Total			196,654,000

[1] In the case of this company the preferred stock here given includes a small amount issued soon after the organization of the company.

This grand total of $196,654,000 may, in view of the preceding discussion, fairly be considered as an approximate measure of the value of the steel works, blast furnaces, real estate, etc., of the various constituent companies of the Steel Corporation, these—except in the case of the Shelby Steel Tube Company—being the values at the time of organization. As pointed out in Chapter II, during the period from such dates to April 1, 1901 (when the Steel Corporation was organized), the investments of these constituent concerns in their manufacturing plants had been increased from surplus earnings. The accumulated surplus earnings of all the constituent companies on April 1, 1901, were approximately $117,700,000, the great bulk of this being contributed by the companies immediately under discussion. A considerable part of this aggregate surplus had been invested in ore, coal and coke, and transportation properties, and there presumably had been some addition to working capital. A part of the original working capital also had been invested in fixed properties, but the net additions from this source and from capital raised through new securities apparently were small.

The total amount which had been thus invested in manufacturing plants can not be precisely stated. However, it may be noted that the Steel Corporation itself made an appraisal of its assets as of January 1, 1908 (see pp. 313–318), in which the iron and steel manufacturing properties were valued at approximately $367,600,000, exclusive of the cost of the new Gary, Ind., plant, and of the Tennessee Coal, Iron and Railroad Company, which had been acquired as of November 1, 1907. The records of the Steel Corporation show that there was added to manufacturing plants by new construction and by purchases of competing companies (again excluding the Gary and Tennessee properties) during the period from April 1, 1901, to January 1, 1908, a net total of approximately $114,500,000 (see Table 41, p. 314), this figure allowing for any depreciation of these properties which had not been restored by expenditures thereon. (This question of depreciation is fully taken up in Chapter VI.) Deducting this sum from the Corporation's estimate of $367,600,000, above given, leaves $253,100,000 as the indicated investment in the manufacturing properties on April 1, 1901.

The Corporation's valuation of $367,600,000 at the end of 1907, however (and consequently the resulting figure of $253,100,000 for 1901), includes real estate at values very much higher than those prevailing in 1901. Allowing for this fact, this 1907 appraisal of the Corporation does not indicate a valuation for the Corporation's manufacturing plants in April, 1901, in excess of $250,000,000. The Bureau has determined upon this figure as a liberal expression of the value of these manufacturing properties at that time.[1] This total is more than $50,000,000 greater than the total indicated value of the manufacturing plants of the constituent concerns at their respective dates of organization, as given in Table 17. There can be little doubt that this excess is more than sufficient to cover all net capital additions to the manufacturing properties of these subsidiaries during the periods that they were in operation prior to April 1, 1901.

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[1] Aside from additions to the value of manufacturing plants through surplus earnings, it might be argued that the values of these plants had increased by April, 1901, on account of appreciation. It is possible that in some cases there was some increase of this sort. On the other hand, there had been heavy depreciation of some of the manufacturing property of the various constituent concerns through dismantling operations and otherwise. Still again, the original cash option prices of many of these plants, as described in Chapter II, and on which these estimates of the Bureau are in large measure based, undoubtedly were in many cases high. Altogether, therefore, it would be unwarranted to assume any significant net increase in the value of these manufacturing properties prior to April 1, 1901, due to appreciation as distinct from increase due to the investment of surplus earnings or of additional capital otherwise obtained.

Section 4. Investment in transportation properties.

It will be noted that the Corporation's estimate, given on page 182, does not distinguish the value of railroad properties from that of steamship and dock properties, but gives the value of the group of transportation companies as a whole at $80,000,000, after deducting bonded indebtedness of $40,340,000. In other words, the Corporation placed a total valuation on the tangible property of this entire group of approximately $120,000,000.[1]

Railroad properties.—The Corporation's estimate of these railroad properties was undoubtedly based upon a more detailed estimate submitted in another affidavit in this same Hodge suit by James H. Reed, president of several of the railroad concerns of the Steel Corporation. Mr. Reed in his affidavit stated that the total construction costs of the six leading railroads of the Corporation were as follows:

Pittsburg, Bessemer and Lake Erie	$30, 000, 000
Duluth and Iron Range	15, 763, 000
Duluth, Missabe and Northern	11, 000, 000
Chicago, Lake Shore and Eastern	6, 400, 000
Elgin, Joliet and Eastern	15, 000, 000
Union Railroad	8, 000, 000
Total	86, 163, 000

A deduction from this total should at once be made for the purposes of this discussion, because the Steel Corporation had only a 52 per cent interest, approximately, in the Pittsburg, Bessemer and Lake Erie. The remaining 48 per cent would, on the basis of Mr. Reed's estimate, represent a total construction cost of $14,400,000. Deducting this sum from the grand total of $86,163,000, as above given, leaves a total of $71,763,000 as the revised statement of construction cost of the 6 railroads. It should be distinctly understood that this total of $71,763,000 is not the value of the Steel Corporation's equity in these railroads, since several of these had outstanding issues of bonds which ranked ahead of the securities owned by the Steel Corporation. This present discussion, however, has reference to the value of these railroad properties as a whole and not merely to the equity which the Steel Corporation held in them. The question of bonded indebtedness, therefore, need not be considered at the moment.

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[1] See note to Table 16, p. 182.

A further deduction from the above total should be made for the reason that inasmuch as Mr. Reed's affidavit was submitted in July, 1902, his figures included additions to this railroad property made by the Steel Corporation since its organization in April, 1901. Such additional expenditures in the nine months of 1901 amounted to $2,375,175. For the entire calendar year 1902 they amounted to $2,988,926. The expenditures for the first half of 1902 (the portion of that year covered by Mr. Reed's affidavit) are not known, but assuming that one-half the total for that year was expended in the first six months, the total capital expenditures on the transportation properties from April 1, 1901, to July 1, 1902, would be approximately $3,870,000. Deducting this sum from the above total of $71,763,000, gives a net total of, roughly, $68,000,000.[1]

In addition to the 6 principal railroads above enumerated, the Steel Corporation owned a number of small roads, a list of which is given on page 191. The aggregate mileage of these miscellaneous roads was small, and the aggregate of their capital securities on June 30, 1901, was only about $2,800,000. Of this $2,000,000 represented the capital stock of the Lake Terminal, the investment back of which was not over one-half that figure. An allowance of $2,000,000 to cover the valuation of these small roads would probably be sufficiently high. Adding this to the total of $68,000,000, as above arrived at, would give a grand total of $70,000,000 as the investment in these roads in April, 1901.

There is good reason, however, to assume that the net figure of $68,000,000 for the six principal roads is too high. In the first place, as already pointed out, the officials of the Steel Corporation were not only naturally likely to overestimate its property, but in the instance under consideration were under very strong temptation to do so. (See p. 182.) Furthermore, as noted below, there is rather strong evidence that Mr. Reed's estimate was chiefly based upon the book values of these roads, which in certain cases were undoubtedly excessive. The following table shows the capital stock, bonded debt, and surplus of the various railroad concerns owned by the Steel Corporation on June 30, 1901, figures for April 1 not being available, except in the case of the Pittsburg, Bessemer and Lake Erie:

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[1] It should be noted that a portion of the capital expenditures on transportation properties presumably were made on the steamship property of the Corporation. Since, however, no deduction will be made from the value of the steamship property on this account, the entire amount of $3,870,000 may properly be deducted from Mr. Reed's estimated investment in the railroad property.

TABLE 18.—OUTSTANDING CAPITALIZATION AND SURPLUS OF UNITED STATES STEEL CORPORATION'S RAILROAD CONCERNS, JUNE 30, 1901.

Company.	Capital stock issued.	Bonded debt outstanding.	Surplus.	Total stock, bonds, and surplus.
Duluth and Iron Range	$3,000,000	$11,232,000	$1,543,255	$15,775,255
Duluth, Missabe and Northern	2,512,000	8,323,000	3,595,511	14,430,511
Elgin, Joliet and Eastern	6,000,000	7,852,000	741,979	14,593,979
Chicago, Lake Shore and Eastern	650,000	3,230,000	897,642	4,777,642
Union Railroad	2,000,000	2,000,000	651,785	4,651,785
Pittsburg, Bessemer and Lake Erie[1]	12,000,000	14,134,160	[2] *996,499*	25,137,661
Youghiogheny Northern	400,000		10,134	410,134
Waukegan and Mississippi Valley	60,000		2,488	62,488
Newburg and South Shore	25,000		24.398	49,398
Elwood, Anderson and Lapelle	50,000		58,388	108,388
Lake Terminal	2,000,000			2,000,000
Johnstown and Stony Creek	91,500		4,756	96,256
Etna and Montrose	60,000		23,507	83,507
McKeesport Connecting	40,000		8,231	48,231
Northern Liberties	5,000		7,448	12,448
Pittsburg and Ohio Valley	60,000		14,030	74,030
Total	28,953,500	46,771,160	6,587,053	82,311,713
Allow for outside interest in Pittsburg, Bessemer and Lake Erie stock 48 per cent	5,760,000	6,784,397	[2] *478,320*	12,066,077
Net total	23,193,500	39,986,763	7,065,373	70,245,636

[1] March 31, 1901.

[2] Deficit.

From this table it appears that the railroad companies of the Steel Corporation had outstanding on June 30, 1901, $28,953,500 capital stock and $46,771,160 of bonds, and that their aggregate surplus accounts amounted to $6,587,053, making a grand total book value of $82,311,713. A deduction, however, should be made to allow for the fact that the Steel Corporation had only a 52 per cent interest, approximately, in the stock of the Pittsburg, Bessemer and Lake Erie Railroad. Making an adjustment in all three items on this account, the total book valuation of the railroad property of the Steel Corporation on June 30, 1901, would be, roughly, $70,250,000. As previously pointed out, this figure does not represent the equity of the Steel Corporation in these roads, but is rather a rough approximation of the total investment in them (except in the case of the Pittsburg, Bessemer and Lake Erie).

Since the current assets of the Steel Corporation are considered as a whole later, in this valuation of the railroad property such current assets should not be included. However, the gross current assets of these railroads on June 30, 1901, were almost exactly offset by the current liabilities, so that the valuations here given are virtually for the fixed property alone.

Taking the six roads specifically mentioned in Mr. Reed's affidavit (see p. 189) and including the total investment in the Pittsburg, Bessemer and Lake Erie to make the figures comparable, it will be seen that the total book valuation on June 30, 1901, was approximately $79,300,000, as compared with the total construction cost a year later, as given by Mr. Reed, $86,163,000. In view of the fact that by the time Mr. Reed's estimate was prepared, the surplus earnings of these roads had increased somewhat, it will be seen there is a very close correspondence between his figure of construction cost and these book valuations.

There can be little doubt that the valuations thus arrived at by the balance sheet express at least the full value of the tangible property of these railroads on June 30, 1901, and probably somewhat overstate that value. In the case of the two leading ore roads, the Duluth and Iron Range and the Duluth, Missabe and Northern, it is probable that the capitalization was not radically different from a fair valuation of the property. In this connection it may be noted that in 1907 the Minnesota State Railroad and Warehouse Commission engaged an engineer with a corps of assistants to make a valuation of the railroads in that State. The engineer submitted estimates both of the value of the physical property of the roads in the State on June 30, 1907, and also of the cost of reproducing them.[1] Two sets of estimates were submitted, one allowing the average values of lands secured for rights of way, yards, and terminals, and the other allowing "multiples" of such values of lands used for these purposes, on the assumption that a railroad company ordinarily would have to pay considerably more than the normal value if sold to private purchasers. An additional allowance was made for the solidification and adaptation of roadbed, apparently on the theory that a railroad is ordinarily put in operation before the roadbed is really brought to a state of perfection.

These estimates for the Duluth and Iron Range and the Duluth, Missabe and Northern (including the "multiples" in question and the allowance for adaptation and solidification of roadbed) were, in round numbers, as follows:

Company.	Value of physical property June 30, 1907.	Cost of reproduction.
Duluth and Iron Range	$17,772,000	$20,565,000
Duluth, Missabe and Northern	20,909,000	23,088,000

It will be seen that both the estimated values as well as the estimated costs of reproduction here given are considerably in excess of the total indicated book valuations of these roads as given in Table 18, but when it is remembered that these book valuations were as of June 30, 1901, and that in the six-year interval up to June 30, 1907 (the date of the foregoing engineering estimates), there had been heavy expenditures, both on the roads and on the equipment, it would appear that these book valuations are a sufficiently liberal expression of the true value of these roads on the earlier date.[1]

In the case of the Elgin, Joliet and Eastern Railway Company, however, the book value apparently considerably overstated a fair valuation of the tangible property. It has been shown (see p. 123) that when the Elgin, Joliet and Eastern was taken over by the Federal Steel Company in 1898 that concern offered to buy the stock on the basis of only 87½ per cent of its par value, payable, moreover, in Federal Steel preferred stock and not in cash. (On deposit of $17.50 in cash, it is true, this Elgin, Joliet and Eastern stock received $87.50 per share in Federal Steel preferred and $70 per share in Federal Steel common.) It is entirely possible that in 1898 the $6,000,000 stock of the Elgin, Joliet and Eastern had no tangible property whatever back of it, and that there is good reason for the opinion that the stock in April, 1901, was only partly covered by tangible assets. The surplus earnings above fixed charges during the period from June 30, 1898, up to April, 1901, were only about $1,000,000.

The investment in the Pittsburg, Bessemer and Lake Erie Railroad also was almost certainly less than the par value of its securities. In fact, the balance sheet showed a substantial deficit on March 31, 1901. The highest price of the common stock in the Pittsburg market in 1900 was only about $30 per share, or 60 per cent of the par value ($50), and it sold in that year below $20 per share. While such market values, as repeatedly pointed out, can not be regarded as in themselves conclusive, still, considering also the fact that the balance sheet itself showed a deficit, there is good reason for assuming that the tangible assets of this road were less than the total outstanding securities.

On the other hand, the total book investment in the Union Railroad, given in Table 18, may somewhat understate a fair value of that property at that time. It will be recalled that Mr. Reed gave the total construction cost of this road at $8,000,000, his estimate, as already pointed out, being made in July, 1902. It seems reasonably certain, therefore, that if the book valuation in the case of the Union

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[1] It should be noted in this connection that these estimates of the cost of reproduction by the engineer employed by the Minnesota State Railroad and Warehouse Commission were considerably under similar estimates made by the railroads themselves a year earlier (June 30, 1906). Including the "multiples" and special allowances above noted in the State estimates, these estimated costs of reproduction compare as follows:

Company.	State estimate, 1907.	Railroad estimate, 1906.
Duluth and Iron Range	$20,565,000	$27,267,000
Duluth, Missabe and Northern	23,088,000	24,032,000

Railroad understates a fair valuation, the amount of that understatement can not be very great.

The miscellaneous smaller roads mentioned in Table 18 may be allowed their full book value without detailed consideration, except in the case of the Lake Terminal, the value of which is conceded to be not over one-half the $2,000,000 capital stock.

It is reasonably certain, therefore, that a fair valuation of the physical property of the Corporation's railroads as a group on April 1, 1901, would be somewhat less than the sum of their capital securities outstanding plus their surplus accounts.

It must be borne in mind that the United States Steel Corporation acquired these railroad properties as going concerns and did not base its price on any appraisal of the tangible assets. Moreover, these railroad properties were owned by companies having large interests in ore or in the steel business, and it is unlikely that any portion of the purchase price of these concerns was specifically allotted to the railroad property. Instead, the prices paid by the Steel Corporation were lump prices for the entire properties as going concerns, and presumably these prices were usually determined by considerations of earning power; in some cases they were probably determined by fear on the part of the organizers of the Steel Corporation of the competition of some of these concerns had they been left outside of the combination.

The reported net profits of these roads for the fiscal year ended June 30, 1900, after deducting interest and other fixed charges, were approximately $4,200,000, or, after deducting 18 per cent of the net earnings of the Pittsburg, Bessemer and Lake Erie, the net total would be approximately $4,080,600. This would be equivalent to about 17.6 per cent upon the $23,193,500 capital stock (again making a deduction on account of the Pittsburg, Bessemer and Lake Erie).

The corresponding earnings of these roads for the year ended June 30, 1901, again after fixed charges and interest were deducted, were approximately $3,650,000, or at the rate of 15.7 per cent on the capital stock.

From the standpoint of earning capacity, therefore, the value of its railroads in 1901 might well have been reckoned by the Steel Corporation at more than the par value of their outstanding securities plus accumulated surplus. From what has been said, however, there can be little doubt that a total of $70,000,000 is a sufficiently liberal estimate of the value of the tangible property alone of these railroads on April 1, 1901. It may be repeated that this is the valuation of the entire tangible property, and not merely the excess of such tangible property over bonded indebtedness.

STEAMSHIP PROPERTIES.—The Steel Corporation at its organization acquired a fleet of 112 vessels with an aggregate of, roughly, 500,000 tons carrying capacity per trip; 69 of these were steamers and 43 were barges. The number of the vessels of the various constituent fleets, and their capacity for the season (based on 19 trips) as compiled from data published in the Iron and Steel Directory for 1901, were as follows:

Company.	Season's capacity.	Capacity per trip.	Per cent.	Vessels.	
				Steamers.	Barges.
	Tons.	*Tons.*			
Bessemer Steamship	4,343,400	228,600	45.8	25	31
Minnesota Steamship	2,052,000	108,000	21.6	12	10
Pittsburg Steamship	1,276,800	67,200	13.5	11	2
American Steamship	1,252,100	65,900	13.2	12	0
National Steel	564,300	29,700	5.9	9	0
Total	9,488,600	499,400	100.0	69	43

It is possible to get at a fairly close valuation for this steamship property. Thus, the Bessemer Steamship Company's fleet, which embraced 56 vessels (25 steamers and 31 barges), with an aggregate capacity of 4,343,400 tons for the season, was purchased for $8,500,000 in cash (payable on or before May 1, 1902). This fleet, it will be seen, represented nearly 46 per cent of the total capacity of the entire fleet of the Steel Corporation. If the remaining vessels had been purchased on the same basis, therefore, the total cost of the entire fleet would have been approximately $18,500,000. However, more than half the vessels of this Bessemer Steamship fleet were barges, which, of course, were less valuable than steamers.

The National Steel Company's fleet of 9 vessels, all steamers, originally cost that company in 1899 $1,511,800. This was an average of approximately $168,000 per steamer, or of $51 per ton based on the carrying capacity per trip. This price per ton is distinctly high, considering the fact that some of the vessels were not new. The explanation of this may have been that the purchase was made in the height of the iron and steel boom of 1899.

The fleet of the American Steamship Company (American Steel and Wire Company) included rather larger and more modern vessels. It will be recalled that the 12 steamers of this company, of which 7 were new, were valued in 1900 by the Inland-Lloyds at $3,035,000. This was at the rate of $46 per ton of capacity (per single trip).

The value of these three fleets is, therefore, rather definitely fixed at not much over $13,000,000. In the case of the Minnesota Steamship Company and the Pittsburg Steamship Company, no specific amount appears to have been allotted for the purchase of their vessels, which were acquired in conjunction with other properties. The book investment of the Minnesota company fleet in April, 1901, however, was $3,360,000 and that of the Pittsburg Steamship Company $3,783,000. Adding these amounts to the valuations of the other three fleets above stated gives a total of $20,189,000, as follows:

Bessemer Steamship Company	$8,500,000
National Steel Company	1,511,800
American Steamship Company	3,035,000
Minnesota Steamship Company	3,360,000
Pittsburg Steamship Company	3,783,000
Total	20,189,800

The valuation of the Minnesota Steamship Company's fleet appears to be rather high. It covered 12 steamers and 10 barges. Several of these, however, appear to have been built in the early nineties and were of comparatively small size and somewhat antiquated type and undoubtedly had suffered considerable depreciation. The book investment of the Pittsburg Steamship Company on the other hand appears to be fairly reasonable, as most of the vessels of this fleet were very large and of modern construction.

While it is probable that most of the valuations above given could with fairness be somewhat reduced, the total reduction would be comparatively small, and the Bureau has decided upon a valuation of $20,000,000 for the entire steamship property acquired by the Steel Corporation in 1901. There can be no question that this valuation is sufficiently high.

The calculations above given are substantially confirmed by computations based upon approximate average per-ton costs. A great many Lake ore vessels were constructed in the years 1899 and 1900. Statements in reliable trade journals indicated that such steamers, when new, cost all the way from about $250,000 to $350,000, or even $450,000 each. While, of course, there were considerable differences in cost for vessels of the same size and even of the same general description, roughly speaking it may be considered that $250,000 would at that time pay for the construction of a modern steamer of anywhere from 5,000 to 6,000 tons cargo capacity per trip, or, say, an average per-ton cost of from $40 to $50. Several steamers of an average capacity of about 7,500 tons appear to have been contracted for at a cost of $350,000 each, or an average of about $45 per ton, and vessels of 10,000 tons each were constructed at this time at from $400,000 to $460,000 each, or from $40 to $46 per ton. Estimates based on a rather large number of individual transactions indicate that an average allowance of about $45 per ton would be sufficiently liberal to represent the construction cost of new ore steamers of what at that time were of the most modern type. The average per-ton cost of barges would be less.

As the combined capacity per single trip of the entire fleet of the Corporation was almost exactly 500,000 tons, the valuation of $20,000,000 above arrived at is equivalent to $40 per ton. In view of the fact that new steamers of the most approved type could be constructed at that time at an average cost of about $45 per ton, an average of $40 per ton for the Steel Corporation's entire fleet in the condition in which it was acquired in April, 1901, is undoubtedly sufficient.

Dock properties.—The principal dock property of the Steel Corporation exclusive of those of the Duluth and Iron Range Railroad and the Duluth, Missabe and Northern Railway (which are included in the estimated valuations of those roads already discussed), and exclusive of receiving docks at Lake ports which have been included with manufacturing properties at those points, was that of the Pittsburg and Conneaut Dock Company, at Conneaut, Ohio. The book investment in this property in April, 1901, was $1,236,375. An allowance of $1,500,000 for this and for all the miscellaneous dock property of the Corporation on that date is undoubtedly sufficient.

Summary.—From the preceding discussion, therefore, it appears that the tangible property of the railroads of the Steel Corporation (including, in the case of the Pittsburg, Bessemer and Lake Erie, only a 52 per cent interest) can not be considered as having been worth on April 1, 1901, more than $70,000,000. The steamship property may be estimated at $20,000,000 and the miscellaneous dock property other than that included with the railroads at not more than $1,500,000. On this basis, the total indicated value of the entire group of transportation properties would have been $91,500,000.

In this estimate no deduction is made for bonded indebtedness. The Corporation's estimate of $80,000,000, given on page 182, allowed for a deduction of $40,340,000 for such indebtedness. Including this the Corporation's estimate of the value of these transportation properties as a group was $120,340,000, or $28,840,000 more than the valuation arrived at by the Bureau. As already stated, it is not so much the purpose of this discussion to criticise the Corporation's estimate as to arrive at a fair approximate valuation of these properties in 1901. In view of the fact, repeatedly pointed out, that the officials of the Corporation had every reason to exaggerate in their estimates and clearly did exaggerate in some of them, this excess of $28,840,000 in the Corporation's estimate (made in July, 1902) of these transportation properties over the values computed by the Bureau (as of April, 1901) is not remarkable.[1]

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[1] It is not quite clear whether the indebtedness of $40,340,000 referred to by Mr. Schwab in his estimate included about $10,000,000 of such bonds owned by the subsidiary companies themselves. If not, this further amount should be added to the Corporation's estimate of $80,000,000, for purposes of comparison.

Section 5. Investment in coke property.

In the estimate of the Corporation above referred to (see p. 182), the value of its coal and coke property was placed at $100,000,000. This estimate was evidently based upon a more detailed estimate submitted in an affidavit in the same suit in July, 1902, by Thomas Lynch, president of the H. C. Frick Coke Company. The essential features of this estimate by Mr. Lynch follow:

The coke properties of the subsidiary companies of the United States Steel Corporation, situate in Westmoreland and Fayette counties, Pennsylvania (Connellsville region), and in McDowell County, West Virginia (Pocahontas region), consist of 42,000 acres (Connellsville coal), which are of the present value of $1,500 per acre, representing an aggregate value of	$63,000,000
Separated from such Connellsville region is what is known as the "Lower Connellsville district," in which the companies own 15,000 acres, which is of the present value of $800 per acre, or in the aggregate	12,000,000
The companies own in Westmoreland and Fayette counties, Pennsylvania, 16,000 Beehive coke ovens, with the necessary equipment for operating the same, houses of employees, etc., of the aggregate value of	12,500,000
The companies own likewise transportation facilities, cars, water plants, etc., of the present value of	2,500,000
The companies also own a lease of 50,000 acres of Pocahontas coal lands in McDowell County, West Virginia, of the value of	2,500,000
The companies also own steam and gas coal in Allegheny, Washington, and Green counties, Pennsylvania, 22,550 acres, at $300 per acre	6,765,000
The companies also own scattered tracts of coal lands at or near mills and furnaces of the subsidiary companies in Ohio, Pennsylvania, Illinois, and West Virginia, 6,500 acres of the present value of $100 per acre	650,000
Total itemized valuations	99,915,000

It will be noted that Mr. Lynch estimated the value of the 42,000 acres of Connellsville coal land at $1,500 per acre. In his affidavit he said:

> The above valuations are figured on the prices now asked for similar coal lands in the several localities. In fact, the Connellsville properties could not be duplicated at any price, for the reason that there is less than 15,000 acres of unmined coal in the entire Connellsville basin outside of the holdings of the subsidiary companies of the United States Steel Corporation.

Comparatively few well authenticated transfer prices of coking-coal property prior to the organization of the Steel Corporation were made public. Several sales were reported at prices in the neighborhood of $1,000 per acre. Coal and Coke (a leading trade journal) in its issue of June 1, 1901, in criticising extremely high valuations placed upon the Steel Corporation's coke property by President

Schwab in certain testimony before the Industrial Commission, referred to the sale of a tract of nearly 200 acres at approximately $1,000 per acre, the coal being described as "excellent and of the strictly Connellsville seam." So far as is known, no transfer of any considerable tract of coal land in the Connellsville region had been made up to the middle of 1902 at so high a figure as $1,500 per acre. A sale of 12 acres in the heart of the Connellsville region was reported in Coal and Coke in July, 1901, at $1,750 per acre, for coal rights alone. This tract, however, was too small to afford any criterion of values generally. The Iron Age, at the close of November, 1901, referred to the sale of 200 acres of "choice coal lands in the Connellsville region" at $1,100 per acre as "the highest price ever paid for coking-coal lands." It had been reported in 1899 that the National Steel Company paid "about" $1,100 an acre for a tract of 717 acres of coking-coal property in the Connellsville district. This price, however, apparently included some coke-oven property.

In view of the fact that the great bulk of these Connellsville coal lands proper were owned by the Steel Corporation and of the further fact that the Corporation was not offering these lands for sale, it obviously was easy for the Corporation to set a price on such lands that could not readily be challenged from the standpoint of open-market prices. However, in view of the foregoing evidence, it is not reasonable to assume that the entire 42,000 acres of Connellsville coal land owned by the Steel Corporation was worth $1,500 per acre in 1902. Admitting that this property may have been worth as much as $1,200 an acre, which in the light of the preceding evidence appears to be a liberal valuation, the aggregate value would be, roughly, $50,000,000 instead of $63,000,000, as estimated by Mr. Lynch.

Similarly, the valuation of $800 per acre for the coal lands in the lower Connellsville region was distinctly above the average of reported transfer prices for such lands in the two years immediately preceding the organization of the Steel Corporation. In fact, for some time after the Steel Corporation was organized, sales of desirable coking-coal property in this region were made around $500 per acre. (See p. 285.) An average of $500 an acre for the 15,000 acres owned by the Steel Corporation in the lower Connellsville district would give a total valuation of $7,500,000, or $4,500,000 less than Mr. Lynch's figure.

It will be noted that Mr. Lynch's estimate included an allowance of $2,500,000 for the equity in the lease of certain Pocahontas coal lands. As this lease was not executed until the close of 1901, it should not be considered in this discussion of the Corporation's assets in April of that year.

The estimate of the coke-oven property and equipment by Mr. Lynch, namely, $12,500,000, undoubtedly was high, and in view of the fact, repeatedly pointed out, that there was an obvious inducement for all the officials of the Steel Corporation making such estimates to submit inflated valuations, there can be no doubt that all of his figures were liberal. With the exception of the coking-coal property, however, the valuations presented by Mr. Lynch may be accepted in this rough comparison.

Using the averages of $1,200 per acre for the Connellsville coal property and $500 per acre for the lower Connellsville coal property, respectively, in place of his valuation of $1,500 per acre and $800 per acre, respectively, and excluding the Pocahontas lease, the grand total of his estimate would be reduced to about $80,000,000. However, during the period from April, 1901, to the date of Mr. Lynch's estimate, the Steel Corporation had made capital additions of rather more than $2,000,000 to its coal and coke property. This further sum, therefore, should be deducted in arriving at an estimate of the investment in such property at the earlier date.

Taking all these facts into consideration, it would seem that there can be little question that a fair valuation for these coke properties on April 1, 1901, would be rather less than $80,000,000. Again, however, in order to give the Corporation the benefit of possible doubt, the Bureau has placed its valuation of these properties in April, 1901, at that figure. Even this value, however, it should be clearly kept in mind, must be attributed in considerable measure to the great concentration of ownership which had taken place in such coking-coal lands prior to their acquisition by the United States Steel Corporation.

Section 6. Value of natural-gas and limestone properties.

NATURAL-GAS PROPERTIES.—The value of property like a natural-gas field, the extent and life of which can not be determined, even approximately, by engineering science, must necessarily be largely a matter of conjecture. There is good reason to suppose that the valuation of $20,000,000 placed on this property by the Steel Corporation in its estimate (see p. 182) is, like the estimates of the values of the other natural resources, decidedly excessive. Moreover (see p. 316), the Steel Corporation, as late as January 1, 1908, claimed a valuation of only $10,360,940 for its natural-gas property. It had acquired considerable such property since April 1, 1901. On the other hand, of course, it had exhausted a considerable amount of its reserve supply of natural gas. While, therefore, it is highly improbable that the market value of this natural-gas property was equal to the $20,000,000 valuation placed upon it in the 1902 estimate, owing to the complete absence of a satisfactory basis for estimating its value, the Bureau has allowed that estimate to stand.

Limestone properties.—The valuation of $4,000,000 placed on the limestone properties of the Steel Corporation, whether excessive or not, is so small as compared with the capitalization of the Steel Corporation that it may be accepted without discussion as the value on April 1, 1901.

Section 7. Current assets of the Corporation.

By reference to Table 16, on page 182, it will be seen that the Corporation reported its current assets on June 1, 1902, at $148,291,000. This was the amount after deducting from the gross current assets all ordinary current liabilities, and likewise certain purchase-money obligations, as will be seen from the following excerpt from the affidavit submitted in behalf of the Corporation by President Schwab:

> The cash and cash assets of the Steel Corporation and subsidiary companies on June 1, 1902, amounted to the sum of $214,278,000, as against which there stood the usual current liabilities and accounts and bills payable and certain mortgages and purchase-money obligations, amounting to $65,987,000, leaving the aggregate net cash assets as of that date $148,291,000, and such aggregate net cash assets have increased more than $12,000,000 since June 1, 1902.

This total of $148,291,000, as stated, was the amount of such current assets on June 1, 1902. The net current assets on April 1, 1901, according to a condensed balance sheet submitted to the Bureau by the Steel Corporation (see Exhibit 6) were about $136,500,000. This figure includes the $25,003,000 cash capital provided the Corporation at its organization. It allows for sundry adjustments in the balance sheets of the subsidiary companies made just after the consolidation was effected, such adjustments, however, not being of especial interest in this connection.

The Bureau, in arriving at this figure of $136,500,000 as the net current assets in April, 1901, has treated the purchase-money obligations and sundry real-estate mortgages of the subsidiary companies, aggregating $21,872,000, as similar in character to bonded indebtedness and not like current liabilities, and therefore it did not deduct them from the gross current assets. The reason for this is that such purchase-money obligations ordinarily ran for a year or several years, and, what is more important, were usually issued against fixed property and not liquid assets. Thus, in the case of the Bessemer Steamship Company, the purchase price of $8,500,000 was first provided for by purchase-money obligations which were not entirely liquidated in cash for nearly two years after the company was acquired.[1] Prior to such liquidation, the fixed property account of the

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[1] Notes representing $4,250,000, or one-half the purchase price, were liquidated in November, 1902. The remainder were paid off later.

Steel Corporation was, of course, increased by the value of this steamship property without a corresponding diminution of its working capital.

The amount of such purchase-money obligations and mortgages deducted from current assets by the Corporation in 1902 was $16,367,000.

Section 8. Summary of value of tangible property acquired by the Steel Corporation in 1901, other than ore.

The preceding valuations of the Bureau for the different classes of property acquired by the Steel Corporation in 1901, with the exception of ore, may now be summarized as follows:

Manufacturing, including blast furnaces	$250,000,000
Transportation	91,500,000
Coal and coke	80,000,000
Natural gas	20,000,000
Limestone	4,000,000
Working assets	136,500,000
Total	582,000,000

The Bureau's estimate of the total value of the tangible property of the Steel Corporation at its organization in April, 1901, *exclusive of ore*, is therefore $582,000,000. The Corporation's valuation for these properties (see Table 16, p. 182), on the other hand, aggregates $700,291,000, or, after adding $40,340,000 indebtedness of transportation companies, and $16,369,000 purchase-money obligations, to make the two sets of figures fairly comparable, the Corporation's total for these classes of property would be $757,000,000. The Bureau's valuation for these properties is thus $175,000,000 less than the valuation as submitted by the Corporation in the Hodge suit in July, 1902. During the interval in question considerable additions had been made to these classes of property by the Corporation, and the discrepancies between the two estimates for these two items are somewhat less than would at first sight appear. The most important difference occurs in the case of the manufacturing properties, for which the Corporation's estimate is $348,000,000, while the Bureau computed the value at $250,000,000. The difference in the two estimates is chiefly due to the excessive valuation by the Corporation. The Corporation's estimate of $348,000,000 for these properties is completely discredited by the fact, already noted, that at the end of 1907, or about five and one-half years later, it valued its manufacturing properties at only $367,600,000, although during this period net capital additions of $114,500,000 had been made to these manufacturing plants, this after ample depreciation had been allowed.

By reference to Table 16, page 182, it will be seen that the Corporation's estimate of the value of its ore property in July, 1902, was no less than $700,000,000, or practically one-half of the grand total valuation of all its tangible assets. In view of the much smaller disparities between the Bureau's valuations and the Corporation's valuations for most of the other classes of property, it is apparent that estimates of the value of the entire tangible assets of the Corporation in April, 1901, must largely depend upon the valuation assigned the ore. On account of the extraordinary value claimed for this ore property by the Steel Corporation, the Bureau has taken up a valuation of this ore by several different methods in the following pages of this chapter.

II. VALUE OF THE STEEL CORPORATION'S ORE PROPERTY IN 1901.

Section 9. Estimated tonnage of Corporation's ore holdings in 1901.

The Bureau has estimated the value of the ore property of the Corporation in 1901 by three different methods—first, on the basis of prices paid for ore in fee about the time the Corporation was organized; second, on the basis of the price paid by the Steel Corporation itself for a large portion of its ore property; and, third, by a calculation of the "present worth" of royalties on leased ore. These various methods are fully explained later.

The first step in calculating the value of the Corporation's ore in 1901 is to get an approximate idea of the quantity. Conclusions must be based largely upon estimates made about the time the Corporation was organized. It is true that estimates of the total quantity of ores embraced in the properties then acquired have since been largely increased, partly as a result of subsequent exploration and partly because of the inclusion of lower grades of ore than were then taken account of. Obviously, however, for the purpose of determining the value in 1901, it would be incorrect to include additional tonnages which have been developed in these ways, because these can not be regarded as having influenced estimates current at that time. It is true that both the purchaser and the seller of a great iron-ore deposit may be influenced by the possibility that the total tonnage will prove considerably greater than either of them are reckoning on at the time of the sale, but there is likewise the possibility that their estimates will prove excessive. These contingencies, however, would affect the price, and are thus taken account of in the present discussion of the value of this ore property.

It is necessary, therefore, to base ideas as to the quantity of the ore reserves of the Steel Corporation in 1901 upon estimates current at the time. One such estimate was that of C. M. Schwab, president of the Corporation, before the Industrial Commission, in May, 1901, when he stated that the company had "over" 500,000,000 tons of ore "in sight" in the Lake region.

In July, 1902, as shown on page 182, Mr. Schwab and other officials of the Steel Corporation estimated the value of the Corporation's ore property at $700,000,000. This estimate was admittedly at the rate of "$1 per ton" on a total estimated tonnage of 700,000,000 tons.[1]

In view of the fact that during the period from the organization of the company up to July, 1902, several large parcels of ore property had been acquired, adding substantially to the total tonnage, this estimate of 700,000,000 tons made by Mr. Schwab in 1902 agrees very well with his estimate of "over" 500,000,000 tons made to the Industrial Commission in the preceding year.

In May, 1901, in a statement submitted to the New York Stock Exchange by the United States Steel Corporation, the ore tonnage of the Lake Superior Consolidated Iron Mines (which owned the most important ore property acquired by the Steel Corporation at its organization) in known or practically explored properties was estimated at from 300,000,000 to 400,000,000 tons, this estimate not including some minor parcels and a considerable acreage of unexplored lands believed to contain ore. This estimate later proved to be a conservative one.

A careful schedule by the Minnesota Tax Commission, made in 1907, or six years after the Corporation was organized, placed the aggregate tonnage of all iron-mining companies in that State at slightly less than 1,200,000,000 tons, and credited the Oliver Iron Mining Company (under whose management all of the ore properties of the Steel Corporation in Minnesota had then been placed) with approximately 913,000,000 tons. These estimates, while apparently made on a conservative basis, included a large acreage of "tonnage prospects;" that is, mining lands which had not been actively operated or developed, but which were believed to contain ore. Of this total of, roughly, 1,200,000,000 tons, about 250,000,000 tons were credited to unexplored lands which had not even been "prospected," but which were near good mining properties. This total, as just stated, was compiled in the year 1907, and the figure given for the United States Steel Corporation (Oliver Iron Mining Company) of 913,000,000 tons included a large tonnage acquired since the Corporation had been organized. Thus, during this interval, the Corporation had acquired the Chemung properties, with an estimated reserve of many millions of tons; the Union-Sharon properties; and, much more important still, a large tonnage by lease from the Great Northern Railway Company.

This total compiled by the Minnesota Tax Commision did not, of course, include the holdings of the Corporation on the older ranges in Michigan and Wisconsin. However, according to the records of the Corporation, by far the greater part (over 85 per cent, not including the Great Northern ore) of its Lake ore reserves in 1907 were in Minnesota, and chiefly on the Mesabi Range.

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[1] In this estimate no distinction appears to have been made between the value of fee and leasehold properties. (See p. 206.)

In view of the foregoing evidence and of the fact that as late as the middle of 1902 officials of the Steel Corporation themselves reckoned on a tonnage of 700,000,000 tons, any estimate above this figure for the Corporation's ore holdings on April 1, 1901, must obviously be rejected. A somewhat lower estimate might, indeed, be justified, but it has been deemed better to use this figure.

PROPORTIONS OF FEE AND LEASED ORE.—Much of the ore property of the Steel Corporation was merely leased and not owned in fee. The value of the fee of an ore deposit (where the ore is not subject to lease or to other incumbrance) is, of course, the price at which such fee could be sold, and in such case that price would represent the total value of the ore in the ground. In the case of a mining lease, however, the lessee simply secures the right to mine the ore as it lies in the ground, on payment of a certain sum per ton for the ore as he mines and ships it, this charge being known as a "royalty;" the rates of royalty vary more or less with particular conditions, such as the location of the mine, and more especially with the quality of the ore. It should be clearly understood that the value of such a leasehold can not be measured by the royalty, but instead is the price at which this mere right to mine the ore can be sold or transferred to another party. In some cases such leaseholds do not have any transfer value whatever. This is shown by the fact that such leases are sometimes renewed at lower rates of royalty than those originally stipulated. On the other hand, many leases have been transferred at a premium, or, as it is termed, a "bonus," over and above the stipulated rate of royalty. Frequently such bonus payments are intended to cover improvements to mining property. In so far as they are paid on account of the ore alone as distinct from improvements, such bonus payments may be regarded as measuring the value of the mining privilege itself, at the stipulated rate of royalty.

In other cases, instead of a cash bonus, such leases are transferred on payment of an additional or increased royalty. (See p. 216.)

It will be seen, therefore, that the idea frequently encountered, that the royalty paid by the lessee indicates the value of his leasehold interest in the ore, is entirely erroneous; such royalties as are actually paid out are a part of the operating cost, like the payments made for labor, materials, etc. The royalty thus being an operating cost, it is obvious that so far as unmined ore in the ground is concerned such a cost can in no sense be regarded as involving an investment. This royalty charge, in fact, becomes a part of the investment only as other cost items do, namely, to the limited extent to which it may enter into ore which has actually been extracted and carried in inventories at a given time.

This matter of ore leases is discussed in more detail in sections 12 and 13.

As will be shown in detail (see pp. 229–231), the value per ton in 1901 of ore held in fee was much greater than the value per ton of leasehold interests. The fact that a large proportion of the Steel Corporation's holdings of ore in 1901 was merely leased has, therefore, an important bearing upon the aggregate value of those holdings. The exact proportions of the tonnages of fee ore and of leased ore to the total estimated deposit of 700,000,000 tons in 1901 can not be stated, but apparently considerably less than one-half the entire quantity was owned in fee. A study of estimated tonnages of some of the more important mines of the Corporation in 1904 indicates that not over one-third of the total holdings at that time was owned in fee. Moreover, it is known that this was about the proportion at a somewhat later date. Since, however, exact data are not available for 1901, the Bureau, in order to avoid possible undervaluation in its calculations, has assumed that one-half the total holdings, or 350,000,000 tons, was owned in fee.

Having thus determined the total tonnage of the ore holdings of the Corporation in 1901, the discussion of the value of this ore property by the three methods outlined on page 203 will be taken up and in the order there shown.

Section 10. Value of Steel Corporation's fee ore property as indicated by prices paid for ore mines in fee by constituent companies in 1899 and 1900.

Nearly all of the Steel Corporation's original ore property was purchased in connection with the other property of the constituent concerns through acquisition of their stocks, and apparently no specific portion of the purchase price was allotted to it. The prices paid for this ore property by the constituent concerns themselves are known in only a few cases. However, with respect to purchases of fee ore (which is the subject of the immediate discussion) made in the early or middle nineties, the figures of original cost, even if available, would be of very little service in preparing an estimate of the value of the same properties in April, 1901. It is obvious that the price originally paid for a mining property in fee does not necessarily or even probably have any close correspondence to the subsequent value after exploration and development. While as a rule the extent and therefore the value of iron-ore deposits can be more accurately determined than that of many other minerals, nevertheless there have been repeated instances where iron-mining properties in the Lake Superior region originally purchased for very small considerations have later sold for great sums. On the other hand, mines for which considerable sums were paid have been abandoned after exploration. It is apparent, therefore, that the value of the fee ore of the Steel Corporation in 1901 can not be satisfactorily determined by a study of the original cost of such ore to its constituent concerns, especially where those concerns acquired the ore several years prior to that date.

The prices paid in 1899 and 1900 by the constituent companies of the Steel Corporation, however, are entitled to consideration. It is true that such prices may have been either very much in excess or very greatly below the value of these properties as determined by subsequent exploration and development, but at any rate the prices paid by these large interests in 1899 and 1900, when competition for ore property by steel concerns was exceedingly keen, must be regarded as a full expression of the valuation placed upon them at that time, and they thus afford some idea of the value of ore in the ground generally. For this reason it is desirable to examine the prices named in a few such fee transfers of important iron-mining properties in 1899 and 1900.

The American Steel and Wire Company purchased a number of mines in 1899 and 1900. The most important of these was the Sauntry, which was secured in fee for $700,000 in cash. This mine contained a very large tonnage of ore, currently estimated at fully 25,000,000 tons. The Steel and Wire company, in fact, in an official statement to the New York Stock Exchange in August, 1899, stated that the mine "measured up between 45,000,000 and 50,000,000 tons of ore," and that the company had estimates running as high as 80,000,000 tons. Again, before the Industrial Commission in November, 1899, John W. Gates, chairman of the Steel and Wire concern, said of this purchase:

> We bought one tract this spring; we paid $700,000 for it; we had the ore measured up in that tract, and it measures, according to the figures of one of the best experts in this country, 83,000,000 tons of ore. I suppose that ore would sell to-day for two or three million dollars.

While only a small portion of this ore was Bessemer, the mine was a very desirable one. The iron content was fairly high at about 58 per cent for dried ore. It will be seen that on the basis of the original estimate of 25,000,000 tons the average cost per ton would be less than 3 cents. Furthermore, it is important to note that Mr. Gates, although testifying (evidently in optimistic vein) during one of the most extraordinary booms ever known in the iron and steel industry, placed the value of this ore body, after the tonnage had been estimated by an expert at 83,000,000 tons, at not over $3,000,000, or at less than 4 cents per ton.

In 1899 the Oliver Iron Mining Company purchased the Security Land and Exploration Company for $300,000. This company owned the Sparta, Genoa, and Towanda mines, as well as considerable other mining land. A portion of the property was leased, but it was currently estimated in trade journals that the Oliver Iron Mining Company in this purchase acquired not less than 6,000,000 tons of ore in fee, and possibly twice that amount, aside from the leasehold interests on additional tonnage. Leaving out of consideration the leased ore, on which, of course, a royalty would have to be paid, and accepting the lower estimate of the tonnage owned in fee, this purchase price would still amount to only 5 cents per ton, this, moreover. including some improvements.

In 1900 the Sharon Steel Company purchased in fee the Sharon mine, in Minnesota, for $150,000. This mine contained a large tonnage of high-grade ore.

This Sharon transaction undoubtedly was an exceptionally fortunate one for the buyers. However, prices paid for many mines transferred in fee at this time were equivalent on the tonnage as then estimated to only a few cents per ton.

In this connection the following excerpt from a brief filed against a tonnage-tax bill in the house of representatives of the Minnesota legislature in 1909 by the delegation from St. Louis County (a large number of the mines of the Mesabi Range being in this county) may be noted:

> The cheapest sales of fee ore we ever knew were for less than 1 cent per ton. The highest that we ever knew were for 15 cents per ton. There may have been sales at a higher price, *but we have never known of one, and upon inquiry can learn of none.*[1]

This positive and deliberate statement, coming from a delegation of men representing the richest iron-ore mining section of the country, is certainly entitled to much consideration, even though it may not be an exact indication of maximum ore values. Furthermore, this statement was made in 1909, or eight years after the organization of the Steel Corporation, during which interval there had been a considerable appreciation in values of ore property.

In view of this emphatic statement, and in view of the preceding evidence that large deposits of ore were purchased in fee as late as 1899 and 1900 for a few cents per ton, there can be little doubt that an estimate of 15 cents per ton as the average value of even the fee ore of the United States Steel Corporation at its organization would be excessive. At 15 cents per ton the estimated 700,000,000 tons of ore controlled by the Steel Corporation (including fee property and leaseholds) would have been worth $105,000,000 to the fee owners, and, of course, less than this for the interest of the Steel Corporation therein, because it owned only a part of this tonnage in fee. In the same way, at an average valuation of 10 cents per ton, the value of this ore body to the fee owners would have been $70,000,000, and at 5 cents a ton $35,000,000.

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[1] Italics by Bureau. It is possible that this statement had reference to Minnesota ore properties only and did not apply to the old range ores of Michigan, but since the great bulk of the Corporation's ore was in Minnesota this is not an important matter.

These estimates do not allow for improvements to mining properties; that is, for the investment in opening up the mines (such as stripping the overburden, the construction of shafts, galleries, etc.), and in mining structures and equipment. The total book investment of the Steel Corporation's subsidiary companies in such improvements in April, 1901, was about $9,000,000. Taking the value of the ore in the ground at an average of 5 cents per ton, the total value of the ore property to the fee owners in 1901, including this investment in improvements, would have been about $44,000,000. Allowing 10 cents per ton for the ore and again adding the improvements, the total value would have been about $79,000,000.

These calculations, as just stated, however, do not indicate the value of this ore property to the Steel Corporation for the reason that only a portion of its holdings were owned in fee, that portion having been estimated at only one-half the total. It is unnecessary to complete the present computation by making an adjustment on account of leasehold properties, because the second and third methods of valuation of the entire property presented in the following sections afford a much more satisfactory basis for arriving at definite conclusions. But it should be clearly understood that the value of the Corporation's interest in this ore would be considerably reduced if allowance were made for the fact that much of its ore was simply leased. (See note, p. 231.) It is, however, worth noting that even if the Steel Corporation had owned the entire 700,000,000 tons of its ore in fee the total value at the extreme figure reported by well-informed mining interests as late as 1909—15 cents per ton—and including improvements, would have been only $114,000,000.

Section 11. Value of Steel Corporation's ore property as indicated by prices paid by the Corporation for certain parcels of its ore.

The second method of determining the value of the Steel Corporation's ore holdings is based upon the prices paid by the Corporation itself for some of its principal ore properties. As already pointed out, most of the ore property acquired by the Steel Corporation at or about the time of its organization was not bought separately, but was included with other property acquired by the purchase of capital stocks of the constituent concerns. In most such purchases there apparently was no appraisal of the different classes of property, and no allotment of any specific part of the purchase price to cover the ore. In some cases, however, it is possible to determine approximately the portion of the purchase price which may fairly be considered as paid for the ore property by itself.

In making any such study of indicated prices for ore property which the Steel Corporation paid for in its own securities, it is imperative to bear in mind that the valuations thus arrived at are almost certain to be excessive. The analysis of property valuations given in Chapter II clearly indicates that the Steel Corporation issued its securities at a rate far in excess of the market value of the tangible property acquired, and that this was also almost invariably true of the constituent concerns themselves. In the case of most of the constituent concerns the evidence indicates that the par value of the preferred stock alone represented the full value of the property acquired. However, in most cases the market value of the preferred and common stock taken together (even though the common stock frequently sold at only a small fraction of the par value) was usually considerably in excess of the par value of the preferred alone. In other words, the mere combining of such properties imparted a value to them collectively which exceeded their aggregate value operating separately and in competition with one another. This increase in valuation merely as a result of consolidation, while partly due to economies effected thereby, must in a measure be regarded as the result of monopolistic or concentrated control. Similarly, the market value of the Steel Corporation's securities was from the start very greatly in excess of the combined market valuation of the securities of the constituent companies. (See p. 242.) This is chiefly because merger and monopolistic values were created by the formation of the Steel Corporation which were reflected in the market value of the securities issued for the properties acquired. Therefore, the price paid by the Steel Corporation in its own securities, even when reduced to the basis of market value, exaggerates the real value (apart from merger value) of the property acquired thereby. A study of values by this method is nevertheless of service, since the resulting valuation arrived at must be regarded as fixing a maximum figure for this portion of the ore property.

Purchase of Lake Superior Consolidated Iron Mines.—A calculation of the value of the Corporation's ore property may be made in the case of the Lake Superior Consolidated Iron Mines, which, as already shown, had enormous ore holdings in the Lake region, aside from an extremely valuable ore railroad. Its ore holdings were officially stated in 1901 (see p. 204) at from 300,000,000 to upward of 400,000,000 tons, and probably constituted two-fifths of the total of the Steel Corporation at that time, and perhaps more.[1] Furthermore, many of the mines of the Lake Superior Consolidated concern were exceptionally well located and contained ore of very high grade. The quality of the ore properties of this company as a whole was certainly equal to the average quality of all the ore properties acquired by the Steel Corporation, while the proportion of the fee ore apparently was higher than for the other ore property of the Corporation. By determining a valuation for so large a fraction of the total, therefore, it is possible to arrive at an approximate valuation, or at least a maximum valuation, of the entire holdings of the Corporation.

As shown in Table 4, on page 113, the United States Steel Corporation issued, roughly, $39,700,000 of its preferred stock (par value) and a like amount of its common stock, or a total of $79,400,000 (par value) for $29,413,905 of the stock of the Lake Superior Consolidated Iron Mines. The average price of the preferred stock of the Steel Corporation during the first year of its existence was 94 and the average price of the common 44. On this basis the amounts of United States Steel stock issued for the Lake Superior Consolidated property would have been worth approximately $55,000,000. While this was substantially the amount obtainable by the vendors, it undoubtedly far exceeded any price which the purchasers would have been willing to pay in actual cash. Moreover, as just shown, such prices in securities, even when reduced to the basis of actual market value, undoubtedly include what was in effect a premium paid to get greater control of the ore situation, and thus exaggerate a fair market valuation of the property if sold under ordinary competitive conditions.

If the property of the Lake Superior Consolidated Iron Mines had consisted exclusively of ore, this figure of $55,000,000 would, of course, represent the cash equivalent amount received therefor. However, in addition to its ore the Lake Superior Consolidated Iron Mines owned $2,512,500 capital stock and $2,305,000 bonds of the Duluth, Missabe and Northern Railway, or a total, par value, of $4,817,500. As pointed out in the analysis of this railroad property (p. 192), there is reason to assume that these securities were substantially covered by tangible value alone, while the high earning power of the road undoubtedly gave the stock a value well in excess of the value of the tangible assets back of it. Its average earnings in 1900 and 1901 were at the rate of over 50 per cent on its capital stock. Furthermore, this railroad, on June 30, 1901, reported a surplus of $3,595,500. The surplus of the road on April 1, 1901, when the Steel Corporation was organized, has been assumed at

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[1] It may be pointed out that a computation by the Corporation in 1908 placed the total amount of ore of the Lake Superior Consolidated Iron Mines on April 1, 1901, at about 487,000,000 tons. Since, however, this estimate was prepared by working backward from the estimated reserve in 1908, the Bureau has used the lower estimates previously made.

$3,000,000 as undoubtedly a conservative figure. The further fact should be noted that this railroad company had long-term contracts for the transportation of the ore taken from the Lake Superior Consolidated company's mines. The ore rate on this road was so high as to insure a liberal profit on its transportation. Furthermore, it was altogether probable that the volume of the ore business would increase in the future with the expansion of the iron and steel industry.

It can not reasonably be doubted that the Steel Corporation, in fixing a price on the Lake Superior Consolidated Iron Mines as a whole, was influenced by the great earning power, present and prospective, of this railroad property and the great advantage of controlling it. In order, however, not to underestimate the value of the ore, the value of the railroad property will be assumed at only the par of the securities owned by the Lake Superior Consolidated Iron Mines plus $3,000,000, for surplus, or a total of $7,817,500.

Since it is obviously impossible to say how much the purchasers of the Lake Superior Consolidated Iron Mines would have been willing to pay for the railroad alone and how much for the ore property, it has been assumed that that portion of the Lake Superior Consolidated Iron Mines stock which may be considered as representing its investment in the railroad property was this amount of $7,817,500 and that this railroad property and the ore property received the same terms, viz, $135 in United States Steel preferred and $135 in United States Steel common stock for each $100 par value of Lake Superior Consolidated stock. This assumption is reasonable in view of the enormous earning power of the road and the greatly increased control of the ore situation which would result to the Steel Corporation from its acquisition. Since the par value of the railroad securities owned by the Lake Superior Consolidated Iron Mines, namely, $4,817,500 plus $3,000,000 for surplus, amounted to $7,817,500, the total stock of the Steel Corporation which may be regarded as issued for this railroad property would have been 135 per cent of this amount in common and in preferred, or $10,553,625, par value, of each class. The Steel Corporation issued in all $39,708,771 of each class of its stock to acquire $29,413,905 stock of the Lake Superior Consolidated Iron Mines (this being the entire issue then outstanding except $10,689). It follows on the above assumption, therefore, that the amount issued for the ore property alone may be considered as the difference between this total amount and the amount issued for the railroad property, or $29,155,146 of each class.

At the average prices of the stocks of the Steel Corporation during the first year after its organization (94 for the preferred and 44 for the common), the preferred stock here assumed to have been issued for the ore property would have been worth $27,405,837, and the common stock $12,828,264, a total of $40,234,101. This total may be considered as substantially the amount obtained (or obtainable if they sold their United States Steel stock) by holders of the Lake Superior Consolidated Iron Mines stock for their ore property. It should be repeated that this valuation must be considered as a maximum limit and probably distinctly excessive. As just shown, each $100 par value of the stock of the Lake Superior Consolidated concern received $135 in United States Steel preferred, and $135 in common stock, a total of $270 at par, the market value of which was $186 (based on the average prices for a year), whereas during the late nineties the stock of the Lake Superior Consolidated company had frequently sold at very much below par and apparently had not sold above $75 per share up to the close of 1900. It should be taken into account that the scattered transactions in the stock in 1900 (particularly in view of the fact that the company had neither paid dividends nor published annual reports) may not have fairly represented its real value. It is incredible, however, that the great increase in price represented by the terms on which the stock was purchased by the Steel Corporation can be explained on the ground that the value of the property had not previously been recognized. Instead, a large part of this great increase in market valuation must be attributed to the fact that the vendors were in a position to dictate their own terms and that the purchasers were willing to pay an excessive price because of the control of ore and transportation thereby secured.

The average prices per ton for ore indicated by this total price of $40,234.000 for the Lake Superior Consolidated ore property are as follows:

Indicated amount received for ore property of Lake Superior Consolidated Iron Mines (leaseholds, fee mines, and improvements)		$40, 234, 000
On basis of 300,000,000 tons this equals	cents per ton	13. 4
On basis of 400,000,000 tons this equals	do	10. 0

These indicated prices per ton are not simply the prices of ore and leaseholds alone, since the total price on which these computations are based included improvements to mining property as well. It should be kept in mind that the proportion of fee holdings of the Lake Superor Consolidated concern to its total ore property appears to have been larger than that for the entire ore property of the Steel Corporation, so that for this reason also results obtained from the use of these figures for this particular purchase are rather too liberal to the value of the Corporation's investment in ore. Thus almost the entire ore holdings of the Carnegie interests were in the form of leases and not owned in fee.

Taking the average value per ton indicated above by using the minimum estimate of tonnage (300,000,000 tons)—that is, the average of 13.4 cents per ton—the indicated value of the entire ore property of the Corporation (700,000,000 tons), if purchased on the same terms, would have been approximately $94,000,000, this including fee properties, leaseholds, and improvements. On the basis of 10 cents per ton (indicated by the use of an estimate of 400,000,000 tons for the Lake Superior Consolidated ore holdings), the indicated value of the entire property would have been only $70,000,000.

It should be repeated that the valuations of the entire ore property of the Corporation in 1901 arrived at by this method probably exaggerate a fair valuation at that time, since they are based upon a price paid for a portion of the total, which has been shown, for several reasons, to have been excessive.

PURCHASE OF UNION-SHARON ORE PROPERTIES.—Some further light upon the value of ore in the ground is furnished by the terms on which the United States Steel Corporation acquired the properties of the Union and Sharon steel companies. These concerns were purchased in the latter part of 1902, payment being made through the guarantee of bonds issued against these properties. The total ore tonnage acquired in this transaction was officially estimated in the annual report of the Steel Corporation for 1902 at "approximately 40,000,000 tons." This substantially agrees with estimates by trade authorities which placed the ore reserves of the Sharon Steel Company at about 21,000,000 tons and those of the Union Steel Company at about 20,000,000 tons.

For the Sharon mining property the Steel Corporation paid, according to its own figures, $4,400,000. This mine was acquired in fee, so that based upon an estimate of 20,000,000 tons, the average cost to the Steel Corporation was 22 cents per ton.

For the Union Steel Company's ore properties, which included the Penobscot mine, owned in fee, and the Donora and Sweeney mines, which were merely leased, the Steel Corporation paid $4,150,567. On the basis of say 20,000,000 tons, the average cost per ton—treating fee and leased ore as a unit—would be about 20½ cents. Had it all been acquired in fee, it is fair to assume that the total cost would have been somewhat greater than the figure above given, which represents the price paid for that portion of the ore bought in fee plus what was practically only a bonus for the right to mine ore from the other mines at a royalty.

The above prices included payment for some construction work and mining improvements.

These prices are considerably above the average prices indicated in the preceding discussion. However, the price paid for these ore properties admittedly represented a substantial profit to the vendors. President Schwab, of the Steel Corporation, in the annual report for 1902, said of this Union-Sharon purchase that the acquisition was effected "on the basis of actual cost of the properties to the vendors, except as to certain ore and coal property and other lands, and as to them on a basis not exceeding actual present value."

In another official statement Chairman Gary stated that the profit of the vendors in the transaction arose solely from their profit in operating their plants to the date of purchase and in the increased value of their ore, coal, and real estate which had been purchased some time previously.

In the case of the Sharon Steel Company, this profit was an exceedingly liberal one. Its Sharon mine, as previously stated, originally cost (in 1900) only about $150,000. This sum covered the entire ore tonnage of the Sharon concern, so that after allowing for the moderate expenditure for improvements to the mine, the profit on this sale apparently was in the neighborhood of $4,000,000. Of course, the mine at the time it was purchased by the Steel Corporation was worth very much more than the Sharon Steel Company had originally paid for it, since the extent of the deposit proved to be far in excess of the original expectations.

A further point to emphasize in all this discussion, however, is that the liberal price for this Sharon property was paid more than eighteen months after the organization of the United States Steel Corporation, during which interval the value of iron ore lands had enhanced, partly, no doubt, because of the obvious policy of the Corporation and of other large steel concerns to extend their holdings of ore property. Despite these conditions, the price paid for the Sharon mine figures out only about 22 cents per ton.

A still more important matter is that the price paid for the Union-Sharon properties as a whole was influenced by the fact that the Steel Corporation by this purchase removed what threatened to be a troublesome and powerful competitor from the field. As shown later, the interests back of the Union-Sharon concern—among whom was H. C. Frick—were very strong and aggressive. Since the manufacturing properties of the Union and Sharon steel companies were admittedly paid for only on a cost basis, it follows that any payment thus made with a view to removing competition really went into the price paid for ore property and other natural resources; most of it went against the ore. (See p. 283.) Therefore, the price nominally paid for the ore was in reality paid both for the ore and the elimination of competition, and can not properly be calculated as for the ore alone. The fact that in the face of all these conditions the price paid for the fee of this Sharon mine at the close of 1902 was only about 22 cents per ton indicates that the valuation of 13.4 cents per ton indicated by the discussion of the Lake Superior Consolidated purchase, which covered a large amount of leased ore, is at least sufficiently high to represent an average for the entire ore property of the Corporation in April, 1901.

Section 12. Value of fee ore as indicated by calculations of "present worth" of royalties on leased ore.

A third method of estimating the value of the fee ore property of the Steel Corporation in 1901 is to compute the present worth at that time on the basis of royalties paid for leased ore.

As already explained on page 205, in the case of mining leases the operator (the lessee) does not acquire the ownership of the mining property, but simply acquires the right to mine the ore at his own expense in consideration of a certain stipulated royalty charge per ton, payable as the ore is mined and shipped. It may be repeated that the value of such a leasehold is not measured by such royalty charge, but instead by the premium or bonus at which the royalty contract could be transferred to another party. At the time when such a lease is originally made the royalty would ordinarily represent the full market value of the mining privilege; that is to say, the fee owner of ore would not ordinarily lease an ore deposit at a royalty of 25 cents per ton if the going rate of royalty on similar deposits in the same vicinity was any higher. Therefore, if the original lessee decided at once to sublease, ordinarily he would find that his leasehold had no transfer value. An exception to this might occur in cases where the rate of royalty was arbitrarily determined, as in the case of Minnesota State leases, which have been made at a uniform rate of 25 cents per ton, regardless of the probable quality and availability of the ore. Moreover, royalty contracts made under ordinary conditions and originally having no transfer value frequently possess such a value at a subsequent date. This may be due to developments either in the mine itself, or in general conditions of the mining business, which make it possible to dispose of the leasehold at an advance or premium over the royalty payable. Such a premium usually takes the form of a cash bonus; it may, however, be expressed in an additional or increased royalty paid by the sublessee to the prior lessee.

Where such a bonus is paid for an unimproved ore property, it represents the equity value in the ore itself. In the case of an improved mine, however, the bonus is often paid, either wholly or in part, on account of such improvements, as, for instance, shafts, or stripping of the overburden from the ore body. However, in this case, the bonus would represent the full transfer value of the leasehold at the time.

In cases where a lease is transferred or sublet in consideration of an increase in royalty the transfer value of the leasehold may be calculated from such additional royalty by the discount method in the manner explained below. (See pp. 217–219.) But such additional royalty, of course, does not indicate any value for the leasehold of the sublessee, because he must be assumed to have agreed to pay a royalty equal to the full market rate, so that he could not immediately transfer his leasehold at any advance over what he had himself agreed to pay. In such a case the sublessee has no transferable interest or asset of appreciable value in the ore property. In other words, a royalty payable does not represent an asset or investment to the lessee paying it. The interest or equity of such lessee is simply the price or consideration at which he could transfer his leasehold to another party, either by obtaining a cash bonus or an advanced royalty over and above that which he himself has contracted to pay to the fee owner or to the prior lessee; that is, as already explained (see p. 205), a royalty payable represents an expense or operating cost to the lessee. Therefore, in computing the assets of a mining company operating a leasehold, it would be entirely wrong to multiply the estimated tonnage in the ground by the rate of royalty payable, although this has frequently been done in such calculations.[1]

While such equity of a lessee may be expressed either by a cash bonus or an advanced royalty, the cash bonus is by far the most common method, and for this reason, as well as for clearness and convenience, in the following discussion such transfer value of a leasehold will be referred to as a cash bonus value.

While, however, the royalty payable does not in any way measure the value of the interest of the lessee in the ore, nevertheless, as shown below, it may be used as a basis for calculating the current market value of the ore to the owner of the unencumbered fee. The principle is as follows: If all the ore in a mine were mined in a single year, the royalty per ton, multiplied by the total tonnage extracted (plus any bonus for ore as distinct from improvements), would represent the approximate total value of the ore in the ground to the fee owner, but since the ore is taken out gradually year by year the present value of the royalty is reduced according to the length of time that the ore remains in the ground, for royalty payments (except as to any stipulated minimum) are made only as the work of extraction and shipment proceeds. Obviously, the present worth of the royalty for the output of a distant year is less than the value of the royalty for the same amount of production in the current year, first, because the lessor (i. e., the owner of the ore) does not receive payment therefor until the ore is produced and shipped, such payment having a present value determined by the principles of discount, and, second, because he is meanwhile exposed to various risks attendant on the progress of mining the ore, which tends of course to enhance the rate of discount. Therefore the fee owner naturally would be willing to sell his mine at a sum considerably less than the aggregate of the royalty payments which he might expect to realize if he leased it over a long period of years. Similarly, the lessee, if he were to purchase the mine in fee instead of making a lease, would expect to pay very much less than the aggregate of such royalties. The exact price which he would be willing to pay probably would not be computed by this method. But it is reasonably certain that on the average such cash prices for ore in fee would be less than the present worth of the aggregate royalty payments, discounted at a reasonable rate of interest. A particular reason is that a fee purchaser must bear the risk of ownership, such as the failure to find as much ore as expected, the discovery of more valuable deposits by competitive interests, or other contingencies which might adversely affect the value of the deposit, particularly the possibility that the ore might not be extracted as rapidly as anticipated. Again, the provisions of iron-mining leases are in many respects liberal to the lessee, thus making him the more indisposed to purchase in fee, unless the price is low. Thus in ordinary mining leases the lessor does not fix the quantity which the lessee must extract each year, but leaves the lessee free to produce as much as he may see fit, subject usually to a stipulation that in any event he shall pay a royalty each year on a certain minimum tonnage. The minimum tonnages thus stipulated, however, are, as above stated, usually comparatively small, although not invariably so. This arrangement, it will be seen, virtually allows the lessee to suspend operations in case he later finds he can secure ore more cheaply by other means, or in case he can not use the ore to advantage for the time being. For these and other reasons, royalty payments when reduced to a present-worth basis would very naturally show a higher total amount than a purchaser would ordinarily be willing to pay outright in cash, even assuming that the total quantity of ore leased was accurately known, which is not the case.

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[1] Such a method of calculating the investment in an ore property is not only absurd for the reasons just given, but also for the further reason that it takes no account of the necessity of determining the " present worth " or discounted value of the royalty.

It may, therefore, be assumed that if the entire 700,000,000 tons of ore estimated to have been acquired by the Steel Corporation in 1901 had been bought in fee the cash price certainly would not have exceeded the present worth of the same deposit obtained by discounting the current rate of royalty for such ore on new leases, together with proper allowance for any bonus values; it probably would have been much less. A computation of such indicated present worth of the royalties, therefore, will be of great service as fixing a maximum limit of valuation. In making such a calculation of the "present worth" of ore in 1901 it is necessary to determine four factors—(1) the estimated tonnage of the deposit; (2) the average royalty per ton and the approximate bonus per ton; (3) the rate of interest at which to discount the future royalty payments; (4) the estimated duration of the deposit.

It should be borne in mind that such computation of the present worth of royalty payments is made in order to ascertain the value of ore in the ground in 1901, with a view to establishing an average figure which may be applied to that portion of the Steel Corporation's ore property which was owned in fee.

TONNAGE OF THE DEPOSIT.—The amount of the deposit which, as already stated on page 205, has been accepted at 700,000,000 tons, will serve as the basis of this discussion. Although only one-half of this total has been assumed to have been held in fee in 1901, it will be much more convenient for reasons shown later to base calculations on the total tonnage, and then apply the average results to that portion held in fee. (See note, p. 228.)

It may be noted that of a given body of ore a certain portion will never be mined, since a part of the ore body is inevitably left in the ground. The estimated tonnage given above, however, will be assumed as a net total; that is, as the amount which can actually be extracted.

AVERAGE ROYALTY AND BONUS PAYMENTS.—The average royalty can be determined with comparative accuracy. The following table shows the average royalty actually paid in 1902 and 1903 on shipments[1] of ore produced from leased mines on the principal ranges of the Lake Superior district, as computed by the Bureau, the totals representing the great bulk of the output of those years (about 75 per cent in the case of the Mesabi Range and about 50 per cent for the other four ranges combined).

TABLE 19.—AVERAGE RATES OF ROYALTY ON IRON ORE PRODUCED IN LAKE SUPERIOR REGION IN 1902 AND 1903, AS INDICATED BY RETURNS TO THE BUREAU COVERING A LARGE PART OF THE SHIPMENTS IN THOSE YEARS.

Range.	1902		1903	
	Tonnage.	Royalty.	Tonnage.	Royalty.
Old ranges:				
Marquette	789,713	$0.212	774,304	$0.213
Menominee	2,769,383	.264	2,100,263	.273
Gogebic	2,736,308	.379	1,991,908	.404
Vermilion	1,163,102	.377	1,041,082	.389
Total, old ranges	7,458,506	.318	5,907,557	.330
Mesabi range	9,837,513	.250	9,712,274	.253
Total, all ranges	17,296,019	.280	15,619,831	.283

Figures for 1901 were not secured. There can be no doubt that the average royalties in that year did not differ appreciably from the figures here given. They probably were a little lower.

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[1] The shipments were practically identical with the production of these mines.

The table shows that the average rate of royalty on the Mesabi Range in 1902 was exactly 25 cents per ton, that for 1903 being only slightly higher. Royalties on the old ranges were somewhat higher, the average for these ranges combined being 31.8 cents per ton in 1902 and 33 cents per ton in 1903.

Combining the figures for all ranges, for the year 1902 the average royalty was 28 cents and for 1903 it was 28.3 cents per ton.

It might be argued, however, that these averages would not be a fair indication of the royalties obtainable in 1901 had all the Corporation's leaseholds been on the market. Undoubtedly some of the best mines of the Steel Corporation already under lease in 1901 at royalties of about 25 cents per ton could have been leased at higher figures had they then been offered for transfer. On the other hand, some of the older mines were nearly worked out, and probably could not have been leased at even the original royalties. Again, many properties acquired by the constituent concerns of the Steel Corporation in 1899 and 1900 contained ore of rather low grade. It is probable that some of these lower-grade mines had not been fully developed, and thus are not fully reflected in the actual royalty averages for 1902 above given. It would therefore be a very serious error to assume that the royalties at which a few of the choicest ore properties of the Steel Corporation might have been re-leased in 1901 would represent a fair average value of all leases in effect at that date.

Very convincing evidence of this is found in the fact that desirable mines were leased at substantially the average royalties above shown for some time after the Steel Corporation was organized. A fair idea of the rates of royalty and bonus payments in new leases entered into during the period from 1900 to 1902 is given by the following table compiled from data furnished by Dwight E. Woodbridge, a mining engineer of Duluth, Minn., and an authority on Lake ore matters:

TABLE 20.—ROYALTY AND BONUS PAYMENTS IN TRANSFERS OF VARIOUS LEASES OF IRON ORE MINES IN THE LAKE REGION, 1900–1902.

[Original data furnished by Dwight E. Woodbridge, of Duluth, Minn. Computations by Bureau.]

Mine.	Character of ore.		Estimated tonnage in deposit.	Cash bonus.	Bonus per ton.	Additional royalty.[1]	Original royalty.
	Per cent iron.	Per cent phosphorus.					
Albany	58.67	0.071	4,945,000	$150,000	0.03	....	0.25
Troy	57.10	.039					
Agnew No. 1	61.50	.050	4,516,000	150,000	.03	....	.25
Agnew No. 2	57.90	.055	8,500,000	250,000	.03	....	.25
Brunt	57.78	.047	2,500,000	60,000	.02	....	.25
Crosby	56.00	(2)	2,490,000	....	....	0.07	.20
Croxton	60.00	.050	4,250,000	60,000	.01	....	[3].20
Cypress	61.11	.058	1,970,000	(4)	....	....	.39
Elizabeth	56.63	.070	11,800,000	350,000	.03	....	.25
Flynn	56.50	.068	1,680,000	50,000	.03	....	.35
Hawkins	58.00 to 59.00	.043 to .050	15,000,000	525,000	.04	....	.20
Iroquois	57.05	.065	2,450,000	(5)	....	....	.25
Jordan	62.01	.063	1,570,000	120,000	.08	....	.20
Laura	60.15	.060	180,000	60,000	.06	.05	.25
Winnifred	62.09	.055	800,000			.10	
Leetonia	59.00	.050	4,516,000	40,000	.01	....	.38
Miller	60.82	.083	2,450,000	50,000	.02	.10	.25
Prindle	59.48	.068	3,027,000	200,000	.07	....	.25
Snyder	57.00	.088	6,000,000	110,000	.02	....	.20
Sweeney	60.40	.058	2,000,000	100,000	.05	....	.35
Susquehanna	60.50	.055	5,000,000	250,000	.05	....	.25
Utica	60.00	.055	2,550,000	150,000	.06	....	.25
Webb	58.08	.082	8,450,000	280,000	.03	....	.25
Total	....	....	96,644,000	2,955,000	.0306	....	.2528

[1] As part of bonus.

[2] No limit stated.

[3] Royalty on production of 100,000 tons or more per annum. Royalty on a production of 25,000 tons per annum, 25 cents; on 50,000 tons and less than 100,000 tons per annum, 22½ cents.

[4] No purchase price.

[5] Royalties to the amount of $50,000 advanced in lieu of cash bonus.

The highest royalty given in the table is 39 cents per ton, and the next highest 38 cents (in which case there was a bonus of about 1 cent per ton). On the other hand, there were several leases at 20 cents per ton royalty, with only small bonus payments. The average royalty for the 23 mines, it will be seen, was almost exactly 25.3 cents; the average bonus was 3 cents. Nearly all these mines were on the Mesabi Range. The close agreement of this average royalty for new leases with the 1902 average computed by the Bureau for that range, as given on page 219, is striking.

It should be noted that many of the mines listed in Table 20 were desirable properties, the ore showing a very high iron content, while the percentage of phosphorus -the presence of which in any large quantity is undesirable—was frequently low.

In addition to these leases reported by Mr. Woodbridge, mention should be made of the lease of the Chemung and Monroe properties in 1902, by the Shenango Furnace Company, both of which were taken at a royalty of only 25 cents per ton (although later transferred to the Steel Corporation on a substantially higher basis), and the Shenango mine at a royalty of 20 cents per ton and a bonus of $500,000. In 1902 the Clairton Steel Company leased the Little-Prindle mine at a royalty of 35 cents per ton. The average of these figures is in line with the average for the list given in the table.

On the old ranges the number of new mines opened after 1900 was comparatively small, but the rates of royalties on new leases in this district were substantially in harmony with the averages above given for those ranges. An exceptional instance occurred in the case of the Negaunee mine, which was leased at a bonus of $1,500,000 over and above a 30-cent royalty. This was a very valuable property on which a great deal of money had been spent in improvements, which undoubtedly explains in considerable measure the large bonus. It may be noted that the royalty itself, without the bonus, was somewhat less than the average royalties for old range mines, shown on page 219.

An exceptionally high bonus was also paid by the National Steel Company in 1899 for the Chapin mine, on the Menominee Range, in Michigan, this bonus amounting to no less than $5,000,000, of which $1,730,000 was paid in cash, the remaining $3,270,000 being paid by the assumption of outstanding indebtedness. The royalty, however, was only 22½ cents per ton. This was considerably less than the going rates of royalty on the Menominee Range for so desirable a property as the Chapin mine, and undoubtedly explains in part the unusually high bonus. Again, this mine had been brought to a high state of development, and there can be no doubt that a considerable part of the bonus represented the cost of improvements rather than the ore itself. The mine was an exceptionally large producer, with enormous quantities of ore in reserve. The large bonus is partly explained by these considerations, but was also probably due in part to the fact that the purchase was made at the very height of the steel trade boom of 1899.

The preceding evidence, therefore, indicates that the average rate of royalty in the Lake Superior region in 1901 was not in excess of 28 cents per ton, and that this figure may be considered as representing a fair average for all leases in effect at that time. Table 20, alone, indeed, would indicate that an average of 28 cents was large enough to cover bonus payments also so far as the Mesabi Range is concerned. However, an allowance for bonus payments is made later. (See p. 230.)

Of course, the value of ore has not remained constant, but has shown material appreciation. This appreciation, however, has unquestionably been due in considerable measure to the great concentration of ore properties which has taken place in the last ten years. This need not be considered in this discussion, however, since the fact that owners of ore property were ready in 1901 (and even in 1902) to lease mines freely for periods of from thirty to fifty years at an average royalty of not over 28 cents per ton warrants making calculations of the " present value " in 1901 on that basis.

Rate of interest for discounting royalty.—The rate of interest at which the " present worth " of an ore deposit should be computed can be determined within reasonably narrow limits. Obviously the present value of a given ore deposit increases as the rate of interest decreases; that is, if the ultimate value for a given ore deposit were discounted at the rate of 6 per cent, the indicated present worth of the deposit would be greater than if it were discounted at the rate of 8 or 10 per cent. As already pointed out, the leasehold system to a very large extent eliminates the element of risk for the lessee, since if it should prove that the amount of ore in the deposit was less than he had anticipated, he would be compelled to pay royalty only on the tonnage actually secured (not less, however, than the annual minimum fixed by the lease). Conversely, if he were to buy the mine outright for cash, he would have to assume the risk of a failure to secure as large a tonnage as expected. It is true, of course, that the amount of the deposit might prove larger than was expected, and this has frequently been the case in transfers of mining property in the Lake region. However, the risk as to the amount of deposit, and various other risks as well, exist and are, of course, borne by the lessor (except as to improvements and similar expenditures which may be made by the lessee).

Therefore, it is reasonable to assume that a steel concern having the alternative of purchasing a mining property in fee, as against leasing it at a fixed royalty for a long period of time, with a low " minimum," would be disposed to figure the present worth of the deposit in fee on a very conservative scale, or, in other words, in so far as the purchaser calculated this fee value on a discount basis, he would be inclined to use a much higher rate of interest than the going rate for conservative investments of a stable character. If the risks attaching to the purchase of iron-ore properties were negligible, a purchaser might discount the value by using the rate of interest obtainable on safe investments. But since there obviously is a considerable risk in the ore mining business, he would use a higher rate, and probably a considerably higher rate. The Bureau has computed the indicated present worth on the basis of several different rates of interest. (See p. 226.) As shown later, it has given chief weight to the results obtained with an interest rate of 6 per cent. In accepting such a rate there can be no doubt that the Bureau arrives at results which do not underestimate the value of the ore.

It may, in fact, be objected that the Bureau has been too liberal in this respect, and that it should have used a higher rate of interest. Indeed, some experts on ore values are inclined to use as high a rate as 10 per cent. However, in dealing with a deposit of as much as 700,000,000 tons, a portion of the speculative risk which is incurred in the case of purchases of individual mines is undoubtedly eliminated, so that there is good reason for not using so high a rate. Moreover, as shown later, the difference between the total value of a deposit of 700,000,000 tons obtained by using, say, 8 per cent, as against 6 per cent, is not large enough to be of special importance in this discussion. (See Table 21, p. 226.)

Duration of the deposit.—The fourth factor, namely, the rate of exhaustion of a deposit, has a direct bearing upon the total value. A rapid rate of production tends to increase the "present worth." Conversely, the longer the ore remains in the ground, earning nothing and subject to taxation, the smaller the immediate value or present worth of the deposit will be at a given rate of royalty.

The rate of production must be estimated. On page 225 it is shown that the yearly output of the Steel Corporation in the Lake region has in the past ten years risen from about 13,000,000 tons to over 23,000,000 tons. If an extremely scientific estimate of the value of the Steel Corporation's ore property by this method were to be undertaken, it would be necessary to make an estimate of the probable rate of production from year to year during the estimated life of the deposit. Scientific estimates of the probable exhaustion of ore reserves based upon experience invariably follow the rule that the rate of production of a given deposit can not constantly increase throughout the entire period of production, but that after increasing for a period will tend to diminish; moreover, the decrease probably will be at a more rapid rate than the increase. This is partly because the development of a great mining property necessarily requires time, while the demand itself is a matter generally of gradual growth. At first the rate of production tends to increase only slowly. After development has reached an advanced stage, the rate of production increases very rapidly. As the maximum stage is reached the rate tends to remain fairly constant for a time. As the deposit becomes exhausted, however, the annual capacity of the mines to produce declines, while the cost of production ordinarily increases, so that a rapid reduction in the rate of output normally occurs.

In this estimate of the value of this ore property, however, it is not necessary to go into such refinements or to attempt to determine the "probable curve of production." With the tonnage under consideration, the difference between the result obtained by assuming a constant rate of output and that obtained by assuming a varying rate apportioned according to scientific calculations would not be important. Thus, as shown in a note at the end of this chapter, the value indicated by assuming that a deposit of 700,000,000 tons of fee ore, to be exhausted during a period of thirty-five years, at a uniform annual rate of production, with a royalty of 28 cents and interest at 6 per cent, is about the same as the value indicated by assuming a varying rate of production (the other factors remaining the same) in substantial accordance with scientific methods.

The production of the United States Steel Corporation from its Lake Superior mines has been as follows, the figures being for calendar years.

Year.	Tons.	Year.	Tons.
1901[1]	13,023,755	1906	20,645,148
1902	16,063,179	1907	22,403,801
1903	15,363,355	1908	15,129,313
1904	10,503,087	1909	21,606,184
1905	18,486,556	1910	23,264,515

[1] Includes production of constituent companies for period January 1 to March 31.

The average production for the first five years shown in the above table was approximately 14,700,000 tons. For the five-year period ended with 1910 it was at the rate of about 20,600,000 tons. (It may be noted that each period included a year of marked depression in the iron and steel industry.) It is reasonably safe to assume an increasing rate of production for many years.

Using as a basis the known production of the past ten years, aggregating approximately 176,000,000 tons, or just about one-fourth of the total deposit under consideration, it must be conceded that the remainder will not be exhausted during another ten-year period. It seems altogether unlikely that it will be exhausted within the next twenty years; that is, during a period of thirty years from the formation of the Steel Corporation. Indeed, it is entirely possible that the original deposit, even if no additions had been made thereto, would not be exhausted within a period of thirty-five years from the time the Steel Corporation was organized.

Of course, since 1901 the Steel Corporation has purchased a great deal of additional ore property, and it is a fair question whether the production of the Corporation would have been as large as it has been if some of these further acquisitions had not been made. This, however, would mean that the life of the deposit under discussion would be extended, which in turn would result in reducing the aggregate value of the deposit in 1901, since, as already shown, the less rapidly the ore is exhausted, assuming a constant rate of royalty, the smaller the present value of the deposit as a whole. Therefore, in so far as the use of the known production of recent years may affect the calculation here made, this is in the direction of increasing valuations for the ore property rather than decreasing them.

INDICATED VALUATIONS.—In view of the obvious impossibility of fixing this time factor with certainty, computations have been made, assuming different exhaustion periods ranging from twenty-five to thirty-five years. The valuations indicated by these different factors of computation are given in the following table. The average present worth of a dollar for a given period at a given rate of interest is first ascertained, and then applied to the rate of royalty, 28 cents. The estimated tonnage of 700,000,000 tons is then multiplied by this resultant figure in order to get the total valuation. The aggregate present worth of one dollar due on the first of each year for a period of thirty years, discounted at the rate of 6 per cent, is $14.591; the average present worth of one dollar for this thirty-year period is, therefore, one-thirtieth of this amount, or, 48.637 cents. The present worth of 28 cents (the average rate of royalty), therefore, for the same period and at the same rate of interest, would be 28 per cent of 48.637 cents, or 13.6184 cents. This, in other words, would be the indicated present worth of each ton of ore in the ground *if owned in fee*, assuming the exhaustion period to be thirty years.[1] Multiplying this by 700,000,000 tons gives a total of $95,329,000 as the value of the entire deposit in 1901 if owned in fee.

This calculation, it may be noted, assumes that the royalty is paid at the beginning of each year; as a matter of fact royalty payments are usually made quarterly. This consideration, however, would not affect the computations here made to an appreciable extent.

TABLE 21.—INDICATED PRESENT WORTH OF AN IRON ORE BODY OF 700,000,000 TONS, AT A ROYALTY OF 28 CENTS PER TON, WITH VARYING RATES OF INTEREST AND PRODUCTION.

Exhaustion period.	Estimated annual production.	Indicated valuations.							
		Interest at 5 per cent.		Interest at 6 per cent.		Interest at 7 per cent.		Interest at 8 per cent.	
		Per ton.	Total.	Per ton.	Total.	Per ton.	Total.	Per ton.	Total.
	Tons.	*Cents.*		*Cents.*		*Cents.*		*Cents.*	
35 years....	20,000,000	13.7544	$96,281,000	12.2948	$86,064,000	11.0832	$77,582,400	10.0696	$70,487,200
30 years....	23,330,000	15.0649	105,454,000	13.6184	95,329,000	12.3928	86,749,600	11.3478	79,434,600
25 years....	28,000,000	16.5743	116,020,000	15.1766	106,236,000	13.9658	97,760,600	12.9125	90,387,500

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[1] It is worth noting that this method of computation may be followed even though the Steel Corporation later added greatly to its ore reserves, so long as it is assumed that the original ore body would last thirty years, whether used separately or in conjunction with subsequent purchases. If it be assumed that the original ore body would last longer than this, the aggregate value would be lessened. On the other hand, if it be assumed that this ore body would be exhausted within a shorter period, the value would be increased.

It should be kept constantly in mind that these calculations do not indicate the value of the leases of the Steel Corporation, but instead they indicate the value of the ore in the ground if owned in fee.

These calculations show that a royalty of 28 cents, discounted at the rate of 6 per cent, on a deposit of 700,000,000 tons of ore, to be exhausted during a thirty-five year period at a uniform rate of production, indicates a present worth at the beginning of the period of $86,064,000. Basing the calculations on an exhaustion period of thirty years, the indicated value is $95,329,000, and on a period of twenty-five years $106,236,000.

If the present worth of this ore body be discounted at the rate of 5 per cent instead of at the rate of 6 per cent, the resulting valuations would be somewhat higher, ranging from roughly $96,300,000 in the case of a thirty-five year period to $116,000,000 for a twenty-five year period.

Discounting the value at the rate of 7 per cent, the total indicated valuation, assuming the exhaustion period to be thirty years, is $86,749,600; and using an 8 per cent rate the total is $79,434,600.

A noteworthy feature of these computations is that, broadly speaking, the results obtained by using rather widely varying factors are not strikingly far apart. Thus the extreme range in the valuations obtained by using the four different rates of interest given in Table 21 and the three different exhaustion periods shown was from $70,487,200 to $116,020,000. By using only an exhaustion period of thirty years the range in the final results obtained by using the four different rates of interest is from $79,434,600 to $105,454,000.

It will be seen, therefore, that in such calculations of present worth considerable differences in the original factors in the problem would exert only a comparatively small influence on the final result. This fairly close agreement of the results obtained by different computations therefore indicates that a result arrived at with any reasonable factors must be somewhere near the mark. It will be noted that the highest figure reached in the computations given in Table 21 is only a modest fraction of the $700,000,000 valuation claimed by the Steel Corporation in 1902.

The Bureau is of the opinion that the result obtained by using an exhaustion period of thirty years and a discount rate of 6 per cent, while liberal to the ore property, is on the whole reasonable.[1] This gives a total value of $95,329,000 or 13.6 cents per ton. This is just about halfway between the extreme figures given in Table 21. The

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[1] It should be understood, of course, that this statement does not mean that the total reserves of the Steel Corporation in the Lake Superior region will be exhausted during such period, since, as above pointed out, the total tonnage has been greatly increased since 1901 by important acquisitions.

Bureau has not selected this result for this reason, however, but because the factors used in arriving at it seemed on the whole the most probable.

Even if it were assumed that the total tonnage of the Steel Corporation in 1901 was as much as 1,000,000,000 tons, comparatively little would be added to the total value of the deposit if the same annual rate of production were used, since this would mean that the additional tonnage would be extracted only at a distant date. For instance, the estimate of $86,064,000 based on a thirty-five year exhaustion period for a deposit of 700,000,000 tons (with interest at 6 per cent) is at the rate of 20,000,000 tons per year. At this rate a deposit of 1,000,000,000 tons would last fifty years. The present value of such a deposit, exhausted at an annual rate of 20,000,000 tons over a period of fifty years, at the rates of royalty and interest above used, would, however, be $93,564,000, or an increase of only $7,500,000. In other words, in this case an addition of over 40 per cent to the assumed tonnage results is an addition of less than 9 per cent to the indicated total value. Of course, if a higher rate of production were used, the aggregate value would show a greater increase.

The obvious reason, from a financial standpoint, for the lower present value of ore reserves not to be used until a remote period in the future, as compared with those to be used at an early date, is that during the entire period of nonuse the owner is realizing nothing from his investment in the property, while, on the other hand, he is bearing certain carrying charges, such as taxes.

Since, as repeatedly pointed out, only a portion of the ore property of the Steel Corporation was owned in fee in 1901, this average value of 13.6 cents per ton should not be applied to the total ore body of 700,000,000 tons. As shown on page 206, it has been assumed that in 1901 one-half of the estimated tonnage, or 350,000,000 tons, was owned in fee. At an average valuation of 13.6 cents per ton, the total value of this portion of the Corporation's ore reserve would be approximately $47,600,000.[1] While it is probable that this valuation is quite sufficient to cover the fee ore, the Bureau has made a substantial addition to it for possible bonus values, as explained in the next section.

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[1] The question might be raised as to the possibility of estimating the value of the fee property of the Steel Corporation in this manner separately from the leaseholds, namely, the assumed 350,000,000 tons of fee ore. This would introduce a number of complications and difficulties without corresponding advantages. In any case such an estimate would tend to reduce the value of the fee ore for the following reasons: The Steel Corporation at present naturally produces the great bulk of its ore from its leaseholds, as there is generally a time limit in the leasehold contract. Hence, a greater part of the fee ore would be left to be extracted at a distant date than of the leasehold ore. This would tend to reduce the indicated value of the fee ore, without resulting in any increase in the value of leasehold ore which is determined on a different basis.

Section 13. Estimated value of ore leases of the Steel Corporation in 1901.

It is now necessary to estimate the value of the leaseholds of the Steel Corporation in 1901 as distinct from the value of the ore held in fee.

The value of the leases—that is, of the privilege of mining ore at stipulated royalties—may be considered as measured approximately by the bonus payments which such leases would command if transferred. Generally speaking, the bonus is the amount paid for the purchase of a leasehold, with its improvements, if any. As already shown, the actual average bonus payments on 23 mines leased during the period 1900–1902, as reported to the Bureau by Dwight E. Woodbridge, a mining engineer of Duluth, were almost exactly 3 cents per ton. This may seem small. One reason why such bonuses have not been larger may be that it has been the policy of the State of Minnesota to lease State ore lands at a uniform royalty of 25 cents per ton. While this has not prevented the exceptionally valuable ore properties from commanding decidedly higher royalties, obviously the fact that desirable unimproved properties could be obtained from the State at royalties of 25 cents per ton had a very important bearing upon the transfer values of leaseholds generally.

While, as already shown, many leases were taken out in 1899 and 1900, and even later, at royalties of about 25 cents per ton, it is probably true that in some of these instances the ore was of lower grade than that covered by leases made earlier at the same rate of royalty; however, much of the ore covered by the new leases was of superior grade. In other words, while leases were still being made in 1901 at about 25 cents per ton, it is probable that earlier leases taken out on especially desirable mines at the same rate of royalty could have been transferred in 1901 at a considerable advance in the royalty or at a rather high bonus. Comparatively few such leases, however, were on the market. On the other hand, as previously pointed out, many leases previously acquired by the Steel Corporation were undoubtedly worth much less in 1901 than they were when originally made. Thus, some of the mines covered by such leases had been worked for years at high rates of production, and were rapidly becoming exhausted, so that the cost of operation was increasing while the annual output was decreasing. Both of these considerations tended, of course, to reduce the value of such leases.

It must be clear that the value of the leaseholds acquired by the Steel Corporation in 1901, when reduced to a per ton basis, was certainly less than the average per ton value of the ore owned in fee, because ore in the ground subject to a royalty clearly is worth less than the same ore free of any such charge. Both the fee and the leasehold properties of the Steel Corporation included very valuable mines, and there is no good reason to assume that the average quality of the ore held in fee was substantially different from that acquired under lease.

While it is entirely possible that the average bonus of 3 cents per ton, shown in Table 20, would be representative of the average transfer value of the Steel Corporation's leaseholds per ton of ore, the Bureau, in order to fix upon a figure which can not be challenged on the ground of undervaluation, has allowed double this figure, or 6 cents per ton. This average of 6 cents, applied to the assumed leasehold tonnage of 350,000,000 tons, gives a total of $21,000,000 for the transfer value of such leaseholds.

In computing the value of the fee ore in the preceding section, the royalty was taken at 28 cents, without any allowance for bonus. While, as stated, the resulting valuation of 13.6 cents per ton seems high in view of all other evidence, nevertheless, since it might be argued that had the fee ore of the Corporation been on the market in 1901 it would have commanded a bonus over the 28-cent royalty, the Bureau has also made here an addition of 6 cents per ton, or $21,000,000, to the value of the fee ore as above computed, this increase being equivalent to the average value of bonuses applied to leased ore. It is almost certain that this valuation for the fee ore is excessive. It gives the fee ore a value of 19.6 cents per ton, whereas the maximum price paid for such ore as late as 1909, according to competent authorities (see p. 208), was reported at 15 cents per ton.

INDICATED TOTAL VALUATION BY DISCOUNT METHOD.—The total indicated valuation of the Steel Corporation's interest in the entire deposit of 700,000,000 tons by this discount or "present-worth" method, therefore, amounts to $89,600,000, as follows:

1. $47,600,000, for the value of the fee ore based upon the average going royalty in 1901, without any allowance for bonus.
2. $21,000,000, to cover the possible bonus value of such fee ore over and above the preceding valuation, had it been available for lease in that year.
3. $21,000,000, for the transfer or bonus value of the leaseholds themselves.

While no specific amount has been allotted in this estimate of $89,600,000 for improvements to mining property, the bonus additions, aggregating for the fee and leased ore together no less than $42,000,000, undoubtedly include a very substantial and possibly an excessive allowance for such improvements. The actual book value of the improvements to the Steel Corporation's mining property in 1901, it will be recalled, was about $9,000,000. To add this sum to the preceding total of $89,600,000 would undoubtedly result in duplication.

It should be repeated that these estimates based on present-worth calculations are probably liberal for several reasons. In the first place, as shown on page 223, the purchaser of an ore body in fee probably would be disposed to discount its present worth at a high rate of interest, thus correspondingly reducing the price which he would pay. The Bureau probably would have been justified in using a higher rate than 6 per cent in its calculation.

Again, these computations are liberal, because it is almost certain that less than one-half the total tonnage of the Steel Corporation was owned in fee. Since the per-ton value of the fee ore is greater than the per-ton value of ore covered by leaseholds, a reduction in the Bureau's estimate of the tonnage owned in fee would involve also a reduction in the total estimated value of the deposit.

Still again, it may be repeated that a delegation of mining interests from the Mesabi region of Minnesota declared as late as 1909 that the highest price that they had been able to ascertain after inquiry to have been paid for fee ore was 15 cents per ton, whereas this calculation based on the discounting of royalties and allowing a bonus in addition resulted in a considerably higher figure.

Section 14. Summary of valuations of Steel Corporation's ore property in 1901.

While the indicated values of the Steel Corporation's ore property in 1901, arrived at by these different methods, show some variation, broadly speaking they work out in substantial harmony, especially when all circumstances are taken into consideration.

In section 10 it was shown that the known prices paid for ore in fee in 1899 and 1900 indicated that an average estimate of 15 cents per ton would undoubtedly be excessive and that an average of, say, 10 cents per ton would be sufficiently liberal. On this basis, the indicated total value of the entire deposit of 700,000,000 tons, *had it all been owned in fee*, would have been $70,000,000, or, allowing $9,000,000 for improvements, a total of $79,000,000. However, the estimate on this basis is ruled out of consideration because fully one-half the total was simply leased.[1]

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[1] It will be recalled that in discussing the value of fee ore in section 10 no deduction was made at the time to allow for the fact that a large part of the ore was simply leased instead of being owned in fee, as the question of leasehold values had not been discussed at that point. Applying the average value of 10 cents per ton to the one-half of the ore property which is here assumed to have been held in fee, would give a value of $35,000,000 for that portion. Adding 6 cents per ton for the remaining half of the property assumed to have been held under lease would give, as above, a value of $21,000,000 for these leaseholds. To this may be added $9,000,000 to cover improvements (although this results in some duplication in the case of the leasehold property, at least). On this basis, the total value of the property as calculated by the first method would be only $65,000,000; in this calculation no addition need be made for the fee ore on account of bonus payments, since the value of the fee ore is calculated on the basis of a fee price.

Moreover, it may be noted that even had the 350,000,000 tons of ore assumed to have been owned in fee been valued at 15 cents per ton the total value of the entire deposit, on the above basis, would have been only $82,500,000.

The estimate based upon the purchase of the Lake Superior Consolidated Iron Mines indicates an aggregate cost of anywhere from $70,000,000 to $94,000,000, had all of the ore property of the Steel Corporation been acquired on the same basis as the reserves of this concern; these figures include improvements as well as the ore itself.

The indicated valuation arrived at by calculations of present worth of royalties is somewhat higher. Using factors in the computation which are distinctly liberal, the indicated total value, including improvements, ranges around $90,000,000.

Altogether, therefore, there is good reason to consider an estimate of $90,000,000 for the value of the ore property of the Steel Corporation in 1901, including improvements, as not only reasonable, but liberal. However, in view of the obvious impossibility of arriving at absolutely correct results, the Bureau has arbitrarily increased its valuation of this ore property to the round sum of $100,000,000.

It might, indeed, be objected by some that the Bureau has been unduly liberal to the Corporation in this valuation of the ore property. In view of the various uncertainties in the problem, the Bureau has deemed it better to err on the side of liberality rather than otherwise.

This total of $100,000,000, it should be repeated, is the indicated market value of the ore property of the Steel Corporation—including fee ore, leases, and improvements—in April, 1901. The Corporation presumably would take the position that the market valuation then current was not the proper basis for capitalization. This question is not at issue at the moment. All that it is desired to show here is the approximate value of the tangible assets of the Corporation at the time of its organization and to compare this valuation with the capitalization of the company, without taking up in this connection the question whether the capitalization should have been restricted to the total of such tangible values.

Section 15. Comparison of Corporation's valuation of its ore with assessed valuations for all companies for taxation purposes.

It is interesting at this point to contrast the Steel Corporation's 1902 estimate of the value of its ore properties ($700,000,000) with the assessed valuation of iron-mining properties for taxation purposes. The Bureau does not, of course, contend that such tax valuations are a fair indication of true valuations, since such property at that period was seldom meant to be taxed at anything like the full value. But at least it is interesting to contrast the valuation claimed by the Corporation in defense of its immense capitalization with the valuations upon which taxes were paid.

Exact figures of tax assessments for the Steel Corporation alone are not available. It is sufficient to show that the valuation claimed by the Steel Corporation's officials in 1902 for the ore of that company was nearly 13 times the total assessed valuation of all iron-mining properties in Minnesota and Michigan (the only States in which the United States Steel Corporation then had ore holdings of any consequence). The assessed valuations of iron-mining properties in these two States for a series of years were as follows:

TABLE 22.—ASSESSED VALUATIONS OF ALL IRON-MINING COMPANIES IN MICHIGAN AND MINNESOTA, 1901–1906.[1]

Year.	Michigan.	Minnesota.	Total.
1901	$22,791,978	$10,409,947	$33,201,925
1902	24,167,593	29,974,470	54,142,063
1903	23,740,466	29,867,084	53,607,550
1904	$22,412,904	$41,903,778	$64,316,682
1905	22,072,513	42,294,003	64,366,516
1906	22,607,154	69,851,845	92,458,999

[1] Includes personal property, which presumably was not included in the Corporation's 1902 estimate of $700,000,000.

It will be seen, therefore, that the assessed valuation of all iron-mining companies in Minnesota and Michigan in 1901 was about $33,000,000, and in 1902 about $54,000,000. Since the holdings of the United States Steel Corporation in 1902 probably did not greatly exceed one-half the total for these States, the enormous difference between the value placed by the Corporation on its ore property in defending its huge capitalization and the figure at which that property was assessed is at once apparent.

These assessed valuations, as just stated, are not presented here as indicating, even approximately, the true values of this ore property. Aside from the fact that mining property in Michigan appears at that time to have been assessed at only about 60 per cent of the true value and that in Minnesota at only about 40 per cent, the methods of valuation in the latter State prior to 1906 were extremely arbitrary, and there can be little doubt that the assessments arrived at were much too low. But at least the fact that the Steel Corporation in 1902, in defending its huge capitalization, placed a valuation of $700,000,000 on its ore property, whereas the total assessed valuation of all ore mines in the two States mentioned was only $54,000,000, may fairly be cited in this connection as further evidence of the unreliability of the estimate made by the Corporation.

In 1907 the Minnesota Tax Commission undertook an elaborate classification of the ore properties of the State, with the result that in recent years the assessed valuation of iron-mining property in Minnesota has been greatly increased. Thus, the assessed valuation in 1910 was in excess of $220,000,000.

III. SUMMARY.

Section 16. Total indicated value of tangible property of Steel Corporation in April, 1901.

Having thus determined upon an approximate valuation of the ore property of the Steel Corporation at its organization in 1901, a grand total of all the tangible property of the Corporation may be arrived at by combining this with the valuations for the other classes of property, as given on page 202. This grand total is presented in the following table. The valuations of the Steel Corporation in 1902, as submitted in the Hodge suit and already given in Table 16, are repeated for purposes of comparison.

TABLE 23.—VALUE OF TANGIBLE ASSETS ACQUIRED BY STEEL CORPORATION IN 1901, AS COMPUTED BY BUREAU, COMPARED WITH ESTIMATE OF CORPORATION SUBMITTED IN THE HODGE SUIT IN JULY, 1902.

Class of property.	Bureau's estimate of tangible values in 1901.	Corporation's estimate of tangible values in 1902.	Difference.[1]
Ore property	$100,000,000	$700,000,000	$600,000,000
Manufacturing plants, including blast furnaces	250,000,000	348,000,000	98,000,000
Railroad, steamship, and dock property	91,500,000	[2] 120,340,000	28,840,000
Coal and coke property	80,000,000	100,000,000	20,000,000
Natural-gas property	20,000,000	20,000,000	....
Limestone properties	4,000,000	4,000,000	....
Cash and cash assets	136,500,000	[3] 164,660,000	28,160,000
Total	682,000,000	1,457,000,000	775,000,000

[1] A part of the differences between the two estimates is accounted for by additions made to property during the interval from April 1, 1901, to July 1, 1902, such additions, of course, being included in the Corporation's figures.

[2] This figure includes $40,340,000 of indebtedness which was not included in the estimate of the Corporation, this addition being made in order to render the estimates comparable.

[3] In arriving at this figure purchase-money obligations and real-estate mortgages of $16,369,000, which were deducted by the Corporation, were restored by the Bureau to make the amounts comparable.

The Bureau, therefore, as a result of its analysis of investment by departments of the business, finds the value of the tangible assets of the Steel Corporation in April, 1901—calculated on a liberal basis throughout—to be approximately $682,000,000. Of this, $100,000,000 represented the ore property, $250,000,000 the manufacturing plants and real estate, $91,500,000 the transportation property, $80,000,000 the coal and coke property, $20,000,000 the natural-gas property, $4,000,000 the limestone property, and the remainder, $136,500,000, the net current assets.

This total, it will be seen, is less than one-half the total as estimated by the Corporation in July, 1902. The excess of the Corporation's figures (after including bonded indebtedness of transportation companies and sundry mortgages and purchase-money obligations to make the two estimates comparable) is $775,000,000. A small part of the difference is due to additions to the investment up to July, 1902. However, the great bulk of the difference between the two valuations is found in the item of iron ore, on which the Corporation in 1902 placed a value seven times the value in 1901 as determined by the Bureau.

As repeatedly pointed out, the Corporation's estimate was prepared when it was on the defensive in an important lawsuit, and furthermore was prepared for the obvious purpose of justifying its huge capitalization. In view of all the evidence presented in this chapter, it is apparent that the Corporation's estimate of its ore property is entitled to practically no consideration. The valuation of the Bureau, on the other hand, has been reached after careful analysis by several different methods, and is entitled to great weight. Moreover, it must be regarded as a rather liberal expression of the value of the ore property in 1901.

It will be noted that the above total of $682,000,000 for all of the tangible assets does not include any specific allowance for good will or other intangible considerations. It may be that some of the valuations above given are sufficiently liberal to include a small allowance for intangible considerations. It is probable, however, that the aggregate of any such amounts is comparatively unimportant.

As a matter of fact, as previously pointed out, the element of good will in the steel industry appears to be much less important than in industries where brand values and trade-marks are important factors. Thus, pig iron of a certain manufacturer does not ordinarily command any special premium over pig iron of the same general description produced by another maker. The same would be substantially true of crude steel and of most of the steel products made by the Steel Corporation. In the case of the Carnegie Company, the splendid organization and high efficiency of the working force undoubtedly gave the business a value in excess of the $160,000,000 of tangible assets credited to it by the Bureau at its organization in March, 1900. However, much of this, instead of being good will which could be permanently transferred, was nothing more than the efficiency of the personnel of the staff, which, in the absence of long-term contracts with the United States Steel Corporation, could not be regarded as at all a permanent or certain addition to its intangible assets. Indeed, subsequent history shows rather frequent withdrawals of the old Carnegie Steel interests from the United States Steel Corporation. Therefore, while the services of these individuals imparted to the business of the Carnegie concern a high degree of earning power as distinct from the value of its tangible assets, this was a consideration which could not properly have been capitalized, at least at any considerable figure, by the Steel Corporation.

It may be repeated that the Bureau's figures do not allow for any additional value which may have been imparted to these properties by the mere act of consolidation. A large part of any such addition is properly excluded from consideration, as it must have been due in a measure to concentration of ownership and control or the restriction of competition. While the merger of such properties, particularly on account of greater integration, might have imparted a considerable value to them as going concerns over and above the aggregate of the valuations prior to consolidation, it is impossible to separate any such increase in value, due to coordination and integration, from the increase due to the elimination of competition, and therefore no quantitative statement of such additional value has been attempted by the Bureau. This matter of merger value is discussed at more length elsewhere. (See pp. 325–327.)

NOTE EXPLAINING PRINCIPLE OF PLOTTING CURVE OF PRODUCTION IN DISCOUNTING ROYALTIES OF LEASED ORE.

It will be recalled that in discounting the value of royalties on leased ore, on pages 224–225, it was pointed out that if a strictly scientific method were to be followed, it would be necessary to plot the probable "curve of production" yearly, instead of assuming a uniform annual rate of production, as was done in the computations summarized in Table 21, on page 226. As there pointed out, in the early stages of the development of a large ore deposit the production tends to increase very slowly until the mine is fairly opened so that large-scale operations are possible. When this occurs there should be a very rapid increase in the production for a time. As the maximum production is reached, the rate tends to remain constant for a time. As the difficulties of mining increase, however, owing to the necessity of going to greater depths and owing to increased costs, this rapid rate of production is checked and in the final stages of the development of the mine—that is, when the remainder of the deposit is rapidly becoming exhausted—the annual production ordinarily should show an abrupt decrease.

While, as already stated, a strictly scientific calculation of the probable curve of production would involve great pains, the allotment given in Table 24 is sufficiently in accord with scientific methods to serve the purposes of this discussion.

TABLE 24.—INDICATED "PRESENT WORTH" OF THE FEE OF AN IRON-ORE DEPOSIT OF 700,000,000 TONS, OBTAINED BY DISCOUNTING A ROYALTY OF 28 CENTS PER TON AT 6 PER CENT OVER A PERIOD OF THIRTY-FIVE YEARS, BASED ON A VARIABLE RATE OF PRODUCTION.

Year.	Estimated annual output.	Royalty.	Present worth for year given at 6 per cent discount of—		Present worth of each year's output.
			$1.00.	$0.28.	
	Tons.				
1	13,020,000	$0.28	$1.000	$0.2800	$3,645,600
2	13,885,000	.28	.9434	.2642	3,667,751
3	14,750,000	.28	.8900	.2492	3,675,700
4	15,615,000	.28	.8396	.2351	3,670,899
5	16,480,000	.28	.7921	.2218	3,655,066
6	17,530,000	.28	.7473	.2092	3,668,047
7	18,765,000	.28	.7050	.1974	3,704,211
8	20,000,000	.28	.6651	.1862	3,724,560
9	21,235,000	.28	.6274	.1757	3,730,395
10	22,470,000	.28	.5919	.1657	3,723,998
11	23,470,000	.28	.5584	.1564	3,669,581
12	24,235,000	.28	.5268	.1475	3,574,759
13	25,000,000	.28	.4970	.1392	3,479,000
14	25,765,000	.28	.4688	.1313	3,382,017
15	26,530,000	.28	.4423	.1238	3,285,581
16	27,030,000	.28	.4173	.1168	3,158,293
17	27,265,000	.28	.3937	.1102	3,005,585
18	27,500,000	.28	.3714	.1040	2,859,780
19	27,735,000	.28	.3503	.0981	2,720,360
20	27,970,000	.28	.3305	.0925	2,588,344
21	27,970,000	.28	.3118	.0873	2,441,893
22	27,735,000	.28	.2942	.0824	2,284,698
23	27,500,000	.28	.2775	.0777	2,136,750
24	27,265,000	.28	.2618	.0733	1,998,634
25	27,030,000	.28	.2470	.0692	1,869,395
26	25,330,000	.28	.2330	.0652	1,652,529
27	22,165,000	.28	.2198	.0615	1,364,123
28	19,000,000	.28	.2074	.0581	1,103,368
29	15,835,000	.28	.1956	.0548	867,251
30	12,670,000	.28	.1846	.0517	654,887
31	10,120,000	.28	.1741	.0487	493,330
32	8,185,000	.28	.1643	.0460	376,543
33	6,250,000	.28	.1550	.0434	271,250
34	4,315,000	.28	.1462	.0409	176,639
35	2,380,000	.28	.1379	.0386	91,897
Total	700,000,000				86,372,714

In this table the early stages of production are not shown, since in the first year given the production of the Steel Corporation (based partly on acquisitions of ore property subsequent to its organization) had already reached 13,000,000 tons. The total production for each of the first two five-year periods as here given is very close to the actual production of the Steel Corporation for those periods. The actual yearly figures of production from 1901 to 1910, however, show very marked fluctuations, particularly on account of a heavy falling off in output in 1904 and 1908. Such exceptional movements are not taken account of in this table, since it would obviously be impossible to attempt to so forecast years of depression throughout the entire period.

In assuming the production for the first ten-year period at a total almost as large as that actually recorded by the Steel Corporation, the Bureau has been very liberal to this assumed original ore deposit of 700,000,000 tons, because, as already pointed out, the aggregate value of such a deposit increases with a high rate of exhaustion; that is to say, as the table clearly shows, a million tons of ore production in the first year is worth very much more than a million tons' production in the last year of the period.

While, therefore, it should be clearly understood that the Bureau is not assuming to predict what the actual yearly production would be from the assumed deposit of 700,000,000 tons, this table gives an idea of the principles involved in a scientific calculation of the probable duration of a given ore deposit.

CHAPTER IV.

SUMMARY OF EVIDENCE OF EXCESSIVE ISSUE OF SECURITIES BY UNITED STATES STEEL CORPORATION IN 1901.

Section 1. Comparison of Bureau's valuations with total outstanding capitalization.

The Bureau's estimates of the value of the investment of the United States Steel Corporation at its organization in April, 1901, arrived at by the three different methods employed—that is, by analysis of the assets of the constituent concerns, by the use of market quotations of securities of those concerns, and by departments of the business of the Corporation itself—may now be summarized and compared with the capitalization of the Corporation at that time. Such a comparison is given in the following table:

Table 25.—COMPARISON OF ESTIMATES OF VALUE OF PROPERTY OF UNITED STATES STEEL CORPORATION AT ITS ORGANIZATION IN 1901, WITH PAR VALUE OF ITS SECURITIES.

		Excess of securities over estimates.
Total capitalization in Apr., 1901, including underlying bonds and purchase-money obligations	[1] $1,402,846,817	
Investment in tangible property alone, indicated by historical analysis	676,000,000	$726,846,817
Value of all property, tangible and intangible, as indicated by market prices of securities of constituent concerns	793,000,000	609,846,817
Value of tangible property as estimated by departments of the business	682,000,000	720,846,817

[1] Excluding $535,407 unacquired stock in constituent concerns for which no corresponding deduction was made in the first and third estimates.

The Bureau's two valuations of the tangible property alone agree very closely, although to a very considerable extent they were arrived at independently of one another. The valuation based on market prices of the securities of the constituent concerns naturally is higher than the other two, since it includes intangible considerations as well.

It will be seen at once that the capitalization of the Steel Corporation in 1901 greatly exceeded the value of the property acquired as indicated by any one of the three methods employed. By the first method, that of historical analysis of the organization of the constituent concerns, the excess of capitalization over tangible assets was, roughly, $727,000,000. By the third method, which also considers tangible assets only, the excess is $721,000,000. Even on the basis of the second method, which, as repeatedly pointed out, is the public's estimate, through the stock market, of the value of the companies as going concerns and which therefore includes intangible as well as tangible assets, the excess is nearly $610,000,000.

Owing to the difficulty, and, indeed, to the practical impossibility, of arriving at a valuation of the intangible assets of the Corporation which would not be influenced by the element of combination (see p. 326), the Bureau has confined its study of the investment to tangible property. For this purpose it has accepted the valuation of $682,000,000 arrived at by the third method, in the manner already described in the preceding chapter. While, of course, absolute precision can not be claimed for this figure, it was reached only after very exhaustive analysis; moreover, in every case the Corporation was given the benefit of reasonable doubt, so that this result must be regarded as distinctly a liberal valuation of the tangible property of the Corporation in 1901. On this basis, no less than $720,846,000 of the total capitalization of the Corporation was unprotected by tangible property values; that is to say, the entire issue of, roughly, $508,000,000 of common stock and over $212,000,000 of the preferred stock had no tangible property back of it at the organization of the Corporation in 1901.

In this connection it may be noted that in testimony before the Ways and Means Committee, in 1908, E. H. Gary, chairman of the Steel Corporation, was questioned with respect to a valuation of $1,782,187,383 for the properties of the Steel Corporation at the close of 1907. An excerpt from his testimony before that committee follows:

> Mr. COCKRAN. Of this whole sum of $1,782,000,000, was not $1,000,000,000, at least, capitalized profits as distinguished from original investment?
>
> Mr. GARY. I should have to guess at that; but I should guess yes, including increases in value.

While an offhand answer to such an important question should not be given too much weight, the resulting valuation of, say, $782,000,000 for the properties at the time the Steel Corporation was formed is surprisingly in line with the valuation of the Bureau already given.

The Bureau does not for the purposes of the present discussion take up the question whether the Steel Corporation should have issued securities up to only the value of the tangible property, as here estimated. As previously pointed out, opinions concerning the proper basis of capitalization are very diverse. The Bureau is not concerned at the moment with the question of what would be the best method of capitalization, but with the relation between the capitalization actually determined upon and the value of the investment represented thereby. The question of the principles of capitalization is one of great general interest, but in this present discussion the Bureau is dealing only with the question of fact. On this point, as already stated, it is clear that there was an excess of more than $700,000,000 of capitalization over the actual investment in tangible property in 1901. Even granting that there may have been a considerable value in the intangible considerations, it is reasonably clear that at least the entire issue of common stock, setting aside all "merger value" (see p. 326), represented nothing but "water."

While, therefore, it is not the purpose of this report to say what should have been the capitalization of the Steel Corporation, it is obvious that the company was heavily overcapitalized, judged by any method of valuing its assets.

Section 2. Comparison of par value of securities of Steel Corporation itself with their market value.

Incidentally it is well to consider briefly the aggregate market value of the securities of the Steel Corporation itself. But it must be clearly recognized that this is in no sense a part of the previous discussion of the value of its assets, because such a computation introduces a wholly new factor, namely, the merger value given to the properties by the very act of combining them under a single great concern, and other intangible considerations.

The average price at which United States Steel preferred stock sold during the first year of the existence of the Corporation—this average being based on an average of the means of the highest and lowest quotations daily—was 94, and the corresponding average for the common stock was 44. The average price of the 5 per cent fifty-year bonds was approximately 115. The average price of the underlying bonds, mortgages, and purchase-money obligations can not be satisfactorily determined. Since transactions in some of these were very infrequent, and in some cases there were no recorded transactions, and since the total amount of these was comparatively small, they may be reckoned at par, as they have been in preceding tables of this sort.

Applying these average prices to the total outstanding capitalization of the Steel Corporation (including underlying bonds, mortgages, and purchase-money obligations) at the time of its organization, the indicated market valuation of these securities was approximately $1,133,144,631, as shown by Table 26 on the following page.

TABLE 26.—COMPARISON OF PAR VALUE OF STEEL CORPORATION'S SECURITIES WITH MARKET VALUE, BASED ON AVERAGE PRICES FOR THE FIRST YEAR AFTER ITS ORGANIZATION.

Security.	Par value.	Average price first year.	Market value based on average price, first year.	Excess of par value over market value.
Preferred stock	$510,205,743	94	$479,593,398	$30,612,345
Common stock	508,227,394	44	223,620,053	284,607,341
5 per cent bonds	303,450,000	[1] 115	348,967,500	[2] *45,517,500*
Underlying bonds, mortgages, and purchase-money obligations	80,963,680	[3] 100	80,963,680	
Total	1,402,846,817		1,133,144,631	269,702,186

[1] Approximately.

[2] Excess of market value over par.

[3] Estimated. Many of these underlying securities were not on the market.

The par value of the Steel Corporation's securities, therefore, shows an excess over the market valuation of $269,700,000. Had the fifty-year bonds been taken at par instead of at the market value (which method might be justified on the ground that the premium was largely influenced by the term of these bonds, and the condition of the money market rather than by property values), the excess would have been about $315,000,000.

It should be unnecessary, however, to argue that a market valuation based upon the prices of the securities of the Steel Corporation itself is not a proper criterion by which to judge the real value of the assets of the Corporation at its organization. It will be remembered that in Table 13, on page 170, it was shown that the market valuation of the securities of the constituent concerns acquired by the Steel Corporation based upon the average prices of 1899 and 1900 (and including $25,003,000 new cash capital as well as underlying indebtedness at par) was $792,961,970. The market value of the securities of the Steel Corporation itself based upon the average prices recorded during the first year of its operation (except for the underlying indebtedness, which is taken at par) is $1,133,144,631, or $340,182,661 more than the market valuation of the securities acquired in the component concerns in 1899 and 1900.

It is apparent, therefore, that the aggregate market valuation was greatly increased as a direct result of the merger of these various constituent concerns under a single control. Undoubtedly much of this increase in market valuation was in the nature of an increase due to concentrated control over the industry. It is incredible that there had been any such enormous increase in the real value of the property in this short interval. A part of the increase was undoubtedly a temporary reflection of current conditions in the stock market. The year 1901 was one of marked prosperity in the steel industry, and despite the acute stock-market panic which occurred in May it was a year of firm and even of rising values for securities in general. The stocks of the Steel Corporation, moreover, undoubtedly were given support by large banking interests during the greater part of the organization period. In view of these facts, and more especially the fact that the Steel Corporation was a consolidation controlling a very substantial proportion of the steel business of the country, this market valuation of its securities of approximately $1,133,000,000 obviously exaggerates a fair valuation of the properties acquired as they existed under separate ownership. Nevertheless, even judged by this unduly favorable standard, the capitalization of the Corporation was very excessive.

It may be noted in this connection that in the latter part of 1903 and the early part of 1904, during a sharp reaction in the steel industry, the market value of its securities was very greatly reduced. Thus the preferred stock in 1903 sold as low as 49¾, and the common stock as low as 10 (the latter sold somewhat lower in 1904). The fifty-year bonds sold as low as 102, while the new 10–60 year bonds, which were issued in that year chiefly to retire preferred stock, sold as low as 65.[1] At these low prices (including underlying indebtedness at par in the absence of quotations), the total market value of the securities of the Corporation was only about $751,000,000,[2] or $382,000,000 less than the aggregate value shown by the 1901 prices.

The Bureau does not contend that this valuation at these low prices is a fair indication of the real value of the property at that time, but this figure illustrates the danger of using stock-market quotations as a conclusive test of values unless averaged over a long period under varying conditions. On the other hand, such stock-market prices, when averaged over long periods, frequently are an exceedingly valuable criterion.

Section 3. Evidence of overcapitalization in excessive issue of stock to underwriting syndicate.

Very convincing evidence of an excessive issue of securities by the Steel Corporation is afforded by the enormous payment which it allowed the underwriting syndicate, so called. The syndicate agreement (a copy of which is given on p. 383) provided that in addition to undertaking to secure at least 51 per cent of the stocks of the various companies originally to be acquired, the syndicate should furnish the Steel Corporation with $25,000,000 cash capital. In addition to this sum, the syndicate incurred expenses of about $3,000,000 attendant upon the organization of the Corporation, through fees, purchase of miscellaneous securities, etc., which sum should be added to the $25,000,000 cash capital provided, in stating the total cash consideration provided by the syndicate. For this total cash consideration of $28,000,000 and its services the underwriting syndicate received from the Steel Corporation the enormous total of practically 1,300,000 shares of its stock (half preferred and half common), of an aggregate par value of $130,000,000. That this huge block of stock was actually received by the syndicate was explicitly stated in the preliminary report of the Steel Corporation, which, after giving the amounts of stock issued to acquire the securities of the constituent concerns, further stated:

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[1] Transactions in the fifty-year bonds were limited. The other securities named, however, were heavily traded in in 1903. It may be noted that if the low-record prices of the common stock in 1904 were combined with the low-record prices of the other securities reached in 1903, the total valuation here reached would be somewhat reduced. It seems fairer, however, to take quotations for all securities at about the same date.

[2] In this calculation allowance has, of course, been made for the fact that $150,000,000 of preferred stock had been exchanged for a like amount of the 10–60 year bonds, while $20,000,000 of such bonds, moreover, had been sold for cash.

> The residue of the common and preferred stock of this Corporation delivered to the syndicate under the contract of March 1, 1901, and not used for the acquisition by it of the stocks of the specified companies, being the shares which, as stated in the syndicate circular of March 2, 1901, were to be retained by and to belong to the syndicate, amounted to 649,987 shares of preferred stock, and 649,988 shares of common stock. This residue of stock or the proceeds thereof, after reimbursing the syndicate the $25,000,000 in cash which it paid to the Corporation, and approximately $3,000,000 for other syndicate obligations and expenses, constituted surplus or profit of the syndicate.

PROFIT REALIZED FROM THIS STOCK BY THE SYNDICATE.—This enormous "residue," as it was termed, yielded a very large profit to the syndicate. At valuations of 44 for the common stock and 94 for the preferred stock (the average prices, respectively, at which these shares sold during the first year after the organization of the Steel Corporation), the total value of these stocks thus delivered to the syndicate would have been approximately $89,700,000. As a matter of fact, it appears that the amount actually realized by the syndicate was about $90,500,000. After reimbursing the syndicate for the $25,000,000 cash capital raised by it, and also for the $3,000,000 incurred in expenses, the syndicate managers paid out in profits to syndicate members substantially $50,000,000. Before distributing these huge profits, however, J. P. Morgan & Co., as syndicate managers, reserved as their compensation 20 per cent of the total profits. The total profits consequently were one-fourth greater than the amount thus distributed to syndicate members, or, in other words, they were, roughly speaking, $62,500,000.

It may be noted that about $4,000,000 of this total was not in the form of cash. After reimbursing the syndicate for its cash obligations of $28,000,000, the syndicate managers paid four cash dividends of $10,000,000 each (after reserving in each case their 20 per cent commission), and a final dividend of $6,000,000 in cash plus $4,000,000 paid-up participation in a syndicate then being organized by J. P. Morgan & Co. to underwrite the so-called "bond conversion" scheme of the Corporation, discussed elsewhere (Chap. VIII). There is some question whether this $4,000,000 participation in the second syndicate realized its par value on the liquidation of that syndicate, but any difference between the amount finally realized and the par value ($4,000,000) was undoubtedly so small that it can be disregarded. The profit on this operation over and above all expenses may therefore be fairly stated at $62,500,000.

There can be no question that this huge compensation to the syndicate, or, in other words, the enormous block of stock upon which this profit was realized, was greatly in excess of a reasonable compensation. The syndicate was, of course, properly to be reimbursed not only for the $25,000,000 new cash capital which it provided the Corporation, and for the $3,000,000 of expenses incurred, but was also entitled to some compensation for the labor and risk of raising these sums. Moreover, the syndicate presumably rendered some other services of value in facilitating the organization of the Corporation and the flotation of its securities, for which it would reasonably expect some compensation. However, these services certainly were not worth anything like the enormous price which the Corporation paid. Nor can this payment be justified on the ground of extraordinary risk. The Corporation was organized at a time of pronounced buoyancy in the stock market and decided prosperity in the steel industry. It is true that only a short time after its organization the famous Northern Pacific corner and the resulting stock-market panic occurred. Such a contingency, however, is one of the possibilities that all underwriting syndicates have to take account of, and was entitled to no more weight in this case than in the case of numerous other underwriting arrangements which were made by other large corporations at the same period.

It is, moreover, true that the nominal liability of the syndicate, or what may be called its nominal capital, was $200,000,000. This, however, was the liability of the syndicate subscribers to the syndicate managers and not to the Steel Corporation, to which its cash liability, as just shown, was only $25,000,000 (not including $3,000,000 of expenses). It was the understanding, tacit or expressed, that the syndicate managers did not expect to call upon the syndicate subscribers for more than a single payment of 12½ per cent of the total nominal liability ($200,000,000), or $25,000,000. As a matter of fact, that was the only call actually made. Had a further call been made upon the syndicate subscribers, this would have been to meet temporary exigencies accompanying the flotation of the Steel Corporation's stock, and not to make any further payment to the Corporation itself. The large nominal obligation of the syndicate subscribers to the syndicate managers apparently was determined upon in part with a view to disarming subsequent criticism of the enormous compensation which it received.

A very important consideration to point out is that while the syndicate was, from the standpoint of the prestige and reputation of the bankers identified with it, nominally compelled to see the organization of the Steel Corporation successfully through, there was no legal obligation of this sort whatever. Instead, a circular of the syndicate managers to the stockholders of the various constituent concerns which were to be acquired stated very positively that the syndicate managers might at any time wholly abandon the transaction, in which event the stockholders in the acquired companies would have no claim whatever against the syndicate managers. This is shown by the fourth paragraph in the official circular of J. P. Morgan & Co., the syndicate managers, as follows:

> The undersigned are authorized to proceed with the proposed transaction whenever in their sole judgment a sufficient amount of the stocks of said companies, or of any of them, shall have been deposited. *They reserve the right, at any time, in their discretion, to wholly abandon the transaction* and to withdraw their offer herein contained, as to all the depositors, by publication of notice of such withdrawal in two daily newspapers in the city of New York; and in that event all the deposited shares shall be returned without charge upon surrender of the respective receipts therefor. *In case of any such withdrawal* of the offer hereunder as to all or to any depositors, *such depositors shall have no claim against the undersigned*, and shall only be entitled to receive their deposited securities upon surrender of the respective receipts therefor.[1]

It may be objected, as just suggested, that it is almost incredible that the syndicate managers would abandon the transaction. Nevertheless, this distinct provision that they might do so if they saw fit, without giving any explanation and without rendering themselves in the slightest way liable, clearly is entitled to great weight in judging the risks assumed by the syndicate. As a matter of fact, as the sequel showed, the syndicate was compelled to bear only a very moderate risk, while it was one of the most profitable ever organized in the United States.

It is worth passing notice that J. P. Morgan & Co., the syndicate managers, in the closing paragraph of their circular to the shareholders, said:

> It is proper to state that J. P. Morgan & Co. are to receive no compensation for their services as syndicate managers beyond a share in any sum which ultimately may be realized by the syndicate.

As just shown, however, the share of J. P. Morgan & Co. in the profits of the syndicate, as syndicate managers only, was about

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[1] Italics by Bureau. (See Exhibit 4, p. 396.)

$12,500.000, in addition to whatever profits they may have made because of their participation in the syndicate as subscribers. In view of this profit, it is hardly remarkable that that firm received no further payment from the Steel Corporation itself.

In this connection it is also proper to point out that the syndicate managers were prominently identified with the management of several of the companies acquired by the Steel Corporation, and also with the management of that Corporation itself. Three partners of the firm were on the directorate of the Corporation, one of whom was also chairman of the finance committee. Moreover, several other leading interests in the underwriting syndicate were the heads of some of the companies acquired and members of the first board of directors of the Corporation. In other words, as managers of the Steel Corporation, these various interests virtually determined the compensation for their services as underwriters.

It may also be stated that in January, 1902, the syndicate managers proposed that a formal agreement of release be executed between themselves and the Steel Corporation concerning this syndicate operation. The following proposition was submitted to the finance committee of the Steel Corporation by the syndicate managers:

> The magnitude of the transactions, and the immense amount involved under the contracts of March 1, 1901, and April 1, 1901, render it important, and it is our desire, that all matters between the Corporation and ourselves, as syndicate managers or otherwise, relating in any way to the issue of the capital stock of your Corporation and to the acquisition of the stocks of other companies, should be definitely closed and settled in such manner that no possible question concerning the same or the amounts or profits involved can be raised in the future. We desire, if practicable, that such a final settlement, which it seems to us should be by way of mutual releases, be had before we distribute the profits of the syndicate among its members.

Such an arrangement was entered into and formally approved by the directors of the Steel Corporation on February 14, 1902. At that time, it may be noted, the profits of the syndicate were estimated by the syndicate managers at about $56,000,000. This proved to be an underestimate, and, as above shown, the total profits actually realized were about $62,500,000.

In addition to the importance of this payment to the underwriting syndicate itself as indicating overcapitalization, this transaction may also fairly be given weight in discussing evidence of excessive issue of securities with respect to the purchase of properties. A corporation which issued roughly $130,000,000 of its securities for a cash consideration of $25,000,000 plus such underwriting and promotion services and expenses as were involved in this case may fairly be regarded as disposed to issue its capital stock on an exceedingly liberal basis for the acquisition of properties. This syndicate arrangement, therefore, may properly be construed as confirming other evidence that the capitalization of the Corporation far exceeded the true value of its assets.

At the invitation of the Bureau, the syndicate managers in 1911 submitted a statement concerning this compensation of the syndicate. Their statement on this point follows:

> As stated in the first preliminary report of this company, submitted to its stockholders at the first annual meeting upon February 17, 1902, and then and there unanimously approved, there was allowed to the underwriting syndicate as its compensation 649,987 shares of the preferred stock and 649,988 shares of the common stock of the new corporation, out of which the syndicate provided the corporation with $25,000,000 cash and distributed approximately $3,000,000 for other syndicate obligations and expenses.
>
> We inclose a copy of the printed syndicate agreement of February 26, 1901, under which the net profits of the syndicate were distributable, and they were distributed one-fifth to the syndicate managers and the remaining four-fifths to the syndicate subscribers, including our firm.
>
> Inasmuch as these commissions and their payment were unanimously approved by the stockholders of the corporation, we should assume that your view (which we regret) that they were excessive in amount has regard, not to the parties immediately concerned, but to what you may consider to be a public interest. In this aspect it would seem to us that, if, as we believe, and as we have above stated, the properties acquired by the Steel Corporation were and are fully worth the par of the entire block of securities by it issued to the syndicate managers in payment therefor, no public injury could or would result from any subdivision between the syndicate managers and their associates of the securities so issued.
>
> We would suggest further that, as the transaction was unique, not only in character, but in immensity, it is possible that any standard short of that furnished by practical experience of necessity must be imaginary and perhaps illusory. Contingencies and reasons involved in this so large a transaction require and justify compensation at a rate which in lesser matters might seem excessive. No ordinary experience can supply a measuring stick for either the purchase price of the properties of the new corporation or the payment of the compensation for such acquisition.
>
> We would call attention also to the fact that the purchase price of the properties transferred under the first contract of March 1, 1901, covered the entire compensation received by the syndicate. The subsequent acquisition under the contract of April 1, 1901, of the so-called Rockefeller properties, the Pittsburg Steamship Company, and the Oliver Iron Mining Company were made by the syndicate managers not on their own account but for and in behalf of the new company, the United States Steel Corporation, and no commissions or compensation for this acquisition was asked or received by the syndicate managers.

The Bureau does not regard the above statement as an adequate defense of the enormous commission obtained by this underwriting syndicate. Undoubtedly the transaction was exceptional with respect to magnitude. This would undoubtedly justify a larger commission in the aggregate than would be justified in the case of a very small underwriting operation. Moreover, the magnitude of the operation might justify a somewhat greater allowance for contingencies, although, as already pointed out, every underwriting syndicate must run the risk of certain contingencies, such, for instance, as a violent disturbance in the stock market, or, on the other hand, a period of continued depression. So far as the above explanation of the syndicate payment rests on the assumption that the properties were worth the par value of the entire amount of stock issued therefor, it is obvious that this view can not be accepted. As a matter of fact, if the properties themselves were regarded by the vendors as worth par, it can not be conceded that those vendors would have been willing to surrender $130,000,000 of the entire capital stock to an underwriting syndicate, except on the ground that they expected to make such extraordinary profits out of the merger that they would thereby be reimbursed. In any event, it is obvious that any such large commission to an underwriting syndicate is a matter of vital importance from a public standpoint.

It may be noted that this statement of the syndicate managers calls attention to the fact that the entire commission was allowed under the first contract, which did not include the acquisition of the Rockefeller properties (the Lake Superior Consolidated Iron Mines and the Bessemer Steamship Company), the American Bridge Company, and the one-sixth interest in the Oliver Iron Mining Company and in the Pittsburg Steamship Company, but that no compensation was received by the syndicate managers for these later acquisitions. This simply means, however, that this syndicate commission covered the acquisition of only a part of the properties of the Steel Corporation. It may be noted in this connection that the second syndicate agreement—that of April 1, 1901 (a copy of this agreement appears on pp. 386–390)—contained a provision that the Steel Corporation, in addition to reimbursing J. P. Morgan & Co. for actual expenditures incurred in the acquisition of these properties thus subsequently brought in, should pay that firm “ fair compensation for their services.” While, according to the above statement, no such compensation was received under this second contract, this can hardly be regarded as remarkable, in view of the fact that the compensation under the first contract netted the syndicate the enormous sum of roughly $62,500,000, of which the syndicate managers received one-fifth, this not including any amount which they may have received as members of the syndicate.

Section 4. Summary of underwriting commissions in the organization of the Steel Corporation and its constituent concerns.

Another way of looking at this large compensation to the underwriting syndicate is that $28,000,000 of the preferred and $28,000,000 of the common stock were issued to cover the $28,000,000 cash liability and expenses of the syndicate, the common stock being regarded as a 100 per cent bonus with the preferred, as was so often done in organizing the constituent concerns. On this basis there would be left $36,998,700 of preferred stock and $36,998,800 of common stock as a "commission" in the strict sense, merely for the services of the underwriting syndicate as distinct from any cash consideration or expense.

This enormous commission to the underwriting syndicate of the Steel Corporation, it will be recalled, followed other heavy commissions of the same sort paid by most of the constituent concerns of the Corporation. The facts concerning the payments of such commissions by the subsidiary companies have already been summarized in Chapter II. (See p. 179.) It was there shown that the total amount of stock issued by seven of the constituent concerns (this not including the American Sheet Steel Company or the Shelby Steel Tube Company) as commissions to promoters of underwriting syndicates, exclusive of bonus stock issued for property or cash, aggregated no less than $63,306,811, of which $62,449,612 was common stock and $857,199 was preferred.

The amounts of stock thus issued as commissions by the subsidiary companies received, of course, the same terms of exchange in the acquisition of these concerns by the Steel Corporation as the other stocks of the same class. As already shown (see Table 4, p. 113), the rates of exchange in most instances were at more than par. By adding the amounts of United States Steel Corporation stock thus issued in exchange for these amounts of the stock of the constituent companies which were originally issued for commissions to the amount of the Steel Corporation's stock above, which may be regarded as such a commission in the strict sense (after deducting $28,000,000 of each class to cover the cash raised or expended by the syndicate), a total is reached which may be regarded as the amount of the Steel Corporation's stock issued directly or indirectly for promotion and organization profits. A summary of such total commissions is given in the following table:

TABLE 27.—AMOUNT OF STEEL CORPORATION'S STOCK ISSUED AS A COMMISSION TO THE UNDERWRITING SYNDICATE, AND AMOUNTS SO ISSUED IN EXCHANGE FOR STOCKS OF CONSTITUENT CONCERNS ISSUED FOR THE SAME PURPOSES, EXCLUDING IN ALL CASES STOCK ISSUED AS A BONUS FOR PROPERTY OR FOR CASH.

Company.[1]	Amount of stock issued to cover promotion charges.	Rates of exchange into U. S. Steel stock.		Total amount of U. S. Steel stocks issued in this exchange.	
		Preferred.	Common.	Preferred.	Common.
Federal Steel Company:					
Preferred	$857,192	110.00		$942,911	
Common	3,599,619	4.00	107.50	143,985	$3,869,590
American Steel and Wire Company, common	11,600,000		102.50		11,890,000
American Tin Plate Company, common	10,000,000	20.00	125.00	2,000,000	12,500,000
National Steel Company, common	5,000,000		125.00		6,250,000
American Steel Hoop Company, common	5,000,000		100.00		5,000,000
National Tube Company, common	20,000,000	8.80	125.00	1,760,008	25,000,000
American Bridge Company, common	7,250,000		105.00		7,612,500
Total, subsidiary companies	63,306,811			4,846,904	72,122,090
Add for U. S. Steel Corporation, after deducting $28,000,000 of each class to cover cash provisions[2]				36,998,700	36,998,800
Grand total securities of U. S. Steel Corporation representing commissions to promoters and bankers for the Corporation and its constituent concerns combined				41,845,604	109,120,890

[1] In this table nothing is included for the American Sheet Steel Company, owing to the absence of accurate information, although apparently there was a large issue of stock to the promoters of this concern. Again, nothing has been included for the Shelby Steel Tube Company, because of the drastic reduction in capitalization effected in the acquisition of this concern.

[2] The deduction of cash expenditures in arriving at the commission proper of the Steel Corporation is somewhat inconsistent with the method followed in the case of the other companies, where the commissions in stock, as stated, are the gross amounts, out of which the respective syndicates had to meet some expenses. In most cases, however, these expenses are believed to have been small, both actually and relatively, and, moreover, the amounts are not known. The expenditures in the case of the Steel syndicate, however, were definitely stated in the preliminary report of the Corporation, and, moreover, were large ($1,200,000 of the expenditures of $3,000,000 appears to have been used to acquire securities of the Carnegie Company). For these reasons it seemed fairer to make an allowance for these cash expenditures in the case of the Steel Corporation syndicate.

From this table it appears, therefore, that more than $150,000,000 of the stock of the Steel Corporation (this including over $41,000,000 of preferred stock and $109,000,000 of common stock) was issued, either directly or indirectly (through exchange), for mere promotion or underwriting services. This total, moreover, as noted, does not include anything for the American Sheet Steel Company, although presumably a large commission, possibly including some preferred stock, was obtained by the promoters of this concern, nor is anything added in the case of the Shelby Steel Tube Company.

It should be repeated that this enormous total of over $150,000,000 does not include common stock issued as a bonus with preferred for property or for cash, but simply what may be termed the promotion and organization commissions in the strict sense. In other words, nearly one-seventh of the total capital stock of the Steel Corporation appears to have been issued, either directly or indirectly, to promoters for their services.

CHAPTER V.

PRINCIPAL ACQUISITIONS OF PROPERTY BY THE STEEL CORPORATION SINCE 1901.

I. ACQUISITION OF COMPETING MANUFACTURING CONCERNS.

Section 1. Principal instances of this sort.

For some time after its organization, the United States Steel Corporation apparently made no effort to secure control of any of the large iron and steel concerns which competed with it. At the close of 1902, however, it made a very important acquisition through the purchase of the Union Steel Company, a merger of a former concern of the same name and the Sharon Steel Company. In 1904 it secured the Clairton Steel Company, a fairly important concern, while in 1907 the Tennessee Coal, Iron and Railroad Company was acquired. An idea of the significance of these various acquisitions is given briefly in the following sections.

Section 2. Purchase of Union Steel Company in 1902.

The acquisition of this company, which, as stated above, had just absorbed the Sharon Steel Company and the old Union Steel Company, is important, not only on account of its large production, but also because both the constituent companies had been organized by individuals who had previously been in the steel business, but who had sold out their properties to one or the other of the various consolidations which later constituted the United States Steel Corporation. This purchase, moreover, was of particular interest because the Union and Sharon steel companies were exceptionally aggressive competitors, with strong financial backing.

Sharon Steel Company.—The Sharon Steel Company was organized in October, 1899, to erect a steel plant at Sharon, Pa. Apparently its original intention was to confine operations chiefly to the manufacture of pig iron and heavy semifinished steel products. The plans were soon changed, however, so as to include a rod mill, a wire plant, wire-nail works, and auxiliary departments. Somewhat later the company also commenced the construction of a tin-plate plant of 10 mills, the number of which was subsequently to be increased to 20; this department was handled through a separate organization, the Sharon Tin Plate Company. Other enlargements were made from time to time.

The original capitalization of the Sharon Steel Company was $3,000,000. This was later gradually increased to $6,000,000, and in addition the company had a small bond issue. However, a large part of the enterprise was financed through subsidiary concerns, so that the capitalization of the parent company does not fairly represent the investment.

An account of the plant published in July, 1901, gave the capacity of the completed blast furnaces at 200,000 tons, not including another blast furnace then under construction. The company also had several open-hearth furnaces under way. There were two continuous wire-rod mills, with a capacity of 120,000 tons. The wire-nail plant was credited with a capacity of 1,000,000 kegs per year, and the wire-drawing plant with about 75,000 tons per year. The construction of a wrought-steel pipe plant was also undertaken about this time, and the capacities of other departments were increased.

It will be seen, therefore, that the company's operations were of a character to bring it into sharp competition with the United States Steel Corporation. It should be noted, moreover, that the company had taken important steps toward securing a supply of raw materials. It had acquired a valuable ore property on the Mesabi Range in the Lake Superior region, while it had long-time contracts with the Minnesota Iron Company for a supply of ore. It had also secured a large tract of coking-coal land in the Connellsville region, while it had other coal lands elsewhere; it also owned a limestone property very close to its manufacturing plant at Sharon, Pa., as well as some terminal railroad property. The company was, therefore, a well-integrated concern.

Union Steel Company.—The Union Steel Company was organized in November, 1899, with $1,000,000 capital stock. The plant was located at Donora, Pa., on the Monongahela River. The company was originally started for the purpose of manufacturing wire rods, wire, and nails. It commenced operations in September, 1901, with a capacity at that time of about 200,000 gross tons of wire rods, 200,000 net tons of wire, and 1,000,000 kegs of nails.

In the meantime it had been decided to construct blast furnaces and an open-hearth steel plant. In connection with this integration of its manufacturing operations, the company acquired a considerable ore property through the Donora Mining Company, a subsidiary company with $500,000 capital stock. It also secured large tracts of coking and steam coal in the Connellsville region. In this connection it may be noted that, as in the case of the Sharon Steel Company, the Union Steel Company's extensions were largely financed through subsidiary concerns, so that the capitalization of the parent company itself in no way represented the investment in the property. (See pp. 282–286.)

Among other influential interests back of the concern was H. C. Frick. Mr. Frick at this time was also a director in the United States Steel Corporation.

Merger of Union and Sharon concerns.—The strong backing of the Union Steel Company, together with its extensive operations, made it an important competitor of the United States Steel Corporation. Its operations assumed still greater significance when, toward the end of November, 1902, announcement was made of the merger of the company and the Sharon Steel Company, under the name of the Union Steel Company, to be capitalized at about $50,000,000, thus forming the largest consolidation in the steel industry proper which had been effected since the organization of the United States Steel Corporation itself. The two concerns, together, had at this time a pig-iron capacity of about 750,000 tons yearly, and an ingot capacity of about 850,000 tons—as against a capacity for the Steel Corporation at this time of about 10,000,000 tons—while they had greatly increased their outputs of finished products. (See Table 29, p. 269.) With this announcement were coupled intimations that plans were already projected for the construction of still further important works, as well as the acquisition of one or two other concerns then engaged in the manufacture of rods, wire products, sheets, and pipe. Moreover, there were rumors that the new concern might construct a railroad of its own from Lake Erie to the Connellsville coke region, with connections to the company's manufacturing plants. The impression was very general in steel circles that the consolidated company would assume a position of rapidly increasing importance in the industry.

These plans for the merger of the Sharon and Union companies had hardly been completed, however, before the further announcement was made (in the latter part of November, 1902) that the United States Steel Corporation had purchased the entire property, payment to be made through the issue of $45,000,000 bonds of the new Union Steel Company, to be guaranteed by the Steel Corporation.[1] The terms of purchase are discussed elsewhere. (See p. 282.) There can be no doubt that the principal motive of the Steel Corporation was to prevent the competition which the rapidly extending operations of the Union concern foreshadowed, and especially to eliminate the rivalry of Mr. Frick.

Section 3. Purchase of Clairton Steel Company.

On April 29, 1904, it was announced that the United States Steel Corporation had purchased the entire capital stock of the Clairton Steel Company; the property was turned over on the 18th of May.

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[1] A portion of this issue was reserved to complete improvements to the properties and to retire prior liens.

The Clairton Steel Company had been organized in 1901, as successor to the St. Clair Steel Company, to construct a large plant for the production of pig iron and semifinished steel products. A controlling interest in the concern was owned by the Crucible Steel Company, a consolidation of the leading crucible steel manufacturers of the country. From a statement later issued by the Crucible Steel Company it appeared that the Clairton company had been losing money, and that it required several millions additional working capital which the Crucible Steel Company apparently did not at that time feel in a position to furnish; the Clairton concern was in the hands of receivers at the time of its transfer to the Steel Corporation.

The manufacturing plant of the Clairton concern included about 140 acres of mill property at Clairton, Pa., on the Monongahela River, with three blast furnaces, twelve 50-ton open-hearth furnaces, a rolling mill, with blooming mills and billet mills, and auxiliary departments. The reported capacity of the plant was about 475,000 tons of pig iron per annum, about 400,000 tons of ingots, and about 325,000 tons of billets and slabs.[1]

The Clairton concern also had important ore and coking-coal properties. One of its ore properties was the St. Clair mine, on the Mesabi Range, with an estimated deposit of about 4,000,000 tons. It had a lease of the Little & Prindle iron mine, on the Mesabi Range, with an estimated tonnage of 3,500,000 tons. In addition the company had extensive holdings on the Marquette Range, in Michigan, the total of these being given in the annual report of the United States Steel Corporation for 1904 at 20,000 acres, all owned in fee.

The coal lands of the Clairton concern comprised 2,644 acres of coking coal in Fayette County, Pa.

The relative importance of the additions to the manufacturing property of the Steel Corporation through the Union and Clairton purchases is indicated in Table 29, on page 269. The cost of these acquisitions is discussed in Chapter VI.

Section 4. Minor acquisitions of manufacturing property.

Other manufacturing properties acquired by the United States Steel Corporation during the first few years of its existence were the Troy Steel Products Company and the Trenton Iron Company. Both of these were small concerns.

Troy Steel Products Company.—This concern was successor to the Troy Steel and Iron Company, which owned steel works at Troy, N. Y., and several blast furnaces at Breaker Island, N. Y. The company was unsuccessful, and in August, 1895, was sold to a reorganization committee. In 1896 the steel works were removed to Breaker Island; the capacity of the plant at this time was about 200,000 tons of slabs and skelp per annum. After this transfer of the steel works, however, the plant was operated only a few months.

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[1] The Crucible Steel Company, it may be noted, in transferring the property, made a ten-year contract with the United States Steel Corporation for a large amount of pig iron and steel which it needed for its own business.

The purchase by the United States Steel Corporation was made in 1902; the terms are discussed elsewhere. (See p. 289.) The concern at this time could not have been considered a competitor, although there had been some negotiations for its sale to interests outside of the United States Steel Corporation. The plant was never operated by the Steel Corporation. The steel works were dismantled in 1907. The blooming mill was removed to the South Chicago works of the Illinois Steel Company, and the blast furnaces were left standing idle. As noted later, certain Standard Oil capitalists, who were also directors of the Steel Corporation, were among the principal owners of the Troy concern.

Trenton Iron Company.—This concern was acquired by the Steel Corporation in July, 1904. The plant, which was originally built in 1845, consisted of a wire-rod mill and a wire works for the manufacture of wire rope and similar products. The annual capacity of the rod mill was only 18,000 gross tons. The acquisition, therefore, was insignificant as compared with those of the Union and Clairton steel companies, previously discussed.

Section 5. Acquisition of the Tennessee Coal, Iron and Railroad Company.

In the latter part of 1907 the United States Steel Corporation acquired the Tennessee Coal, Iron and Railroad Company. This was the leading concern in the southern iron and steel district, with an outstanding capital stock of about $30,000,000 and a bonded indebtedness of $14,226,000. The manufacturing properties included the Ensley Steel Works, at Ensley, Ala., with 100 acres of mill property, 6 blast furnaces, a Bessemer plant, 8 open-hearth steel furnaces, a blooming mill, a rail mill, and other auxiliary departments; also rolling mills at Bessemer, Ala., with plate and merchant mills. The company had 10 other blast furnaces at various other points. It owned the capital stock of the Birmingham Southern Railroad Company, with 31 miles of main and branch lines and about 70 miles of yarding and siding. The equipment of this road comprised 35 locomotives and 725 cars. The Tennessee Coal, Iron and Railroad Company also owned the entire security issues of various land companies adjoining its properties.

The most important assets of the Tennessee concern, however, were its enormous holdings of ore and coal, and there can be little doubt that the desire to secure these had much to do with its purchase by the Steel Corporation.

These ore and coal properties were very extensive. The 1904 report of the Tennessee Coal, Iron and Railroad Company placed the total ore tonnage at over 400,000,000 tons, and the total tonnage of coal at over 1,600,000 tons. The 1906 report of the company, however, stated that the ore reserves were, as computed by competent authorities, estimated to be 700,000,000 tons, and the coal at 2,000,000,000 tons.

More careful estimates were made subsequently by agents of the Steel Corporation. The estimates of these agents grouped these resources in three classes, namely, " proven," " probable," and " possible." Their estimate of the coal property of the company follows:

	Proven.	Probable.	Possible.	Total.
	Tons.	*Tons.*	*Tons.*	*Tons.*
Coking coal	217,000,000	90,000,000	150,500,000	457,500,000
Steam and domestic coal	68,000,000	351,800,000	520,000,000	939,800,000
Total	285,000,000	441,800,000	670,500,000	1,397,300,000

The iron-ore deposits of the company were estimated by the same agents as follows:

	Reasonably assured (including tonnage already developed).	Additional probable tonnage.	Total.
Red ores	175,600,000	279,600,000	455,200,000
Brown ores		3,150,000	3,150,000
Red ore of lower grade, but which may be of future value.	204,000,000	35,000,000	239,000,000
Total	379,600,000	317,750,000	697,350,000

While these figures, especially those for coal, are considerably under those given in the earlier estimates made by the representatives of the Tennessee Coal, Iron and Railroad Company, nevertheless they show beyond a doubt that the company's deposits of these raw materials are enormous. The value per ton of southern ore, however, is much less than that of Lake Superior ore; and the coking coal produced in the South is on the average inferior to northern coking coal.

The following table gives an idea of the relative importance of the Tennessee company and of the Steel Corporation from a producing standpoint, as indicated by the production of each in the year 1907. The relative capacity of the Tennessee company for steel rails and other rolled steel products, however, was somewhat greater than these 1907 figures of production would indicate. (See Table 29, p. 269.)

TABLE 28.—COMPARATIVE PRODUCTION[1] OF UNITED STATES STEEL CORPORATION AND TENNESSEE COAL, IRON AND RAILROAD COMPANY OF ORE, COKE, AND CERTAIN IRON AND STEEL PRODUCTS, 1907.

	By U. S. Steel Corporation.[2]	By Tenn. Coal, Iron & R. R. Co.	Total United States production.[2]	U. S. Steel Corporation's percentage of total of the United States.	Tenn. Coal, Iron & R. R. Co.'s percentage of total of the United States.
	Gross tons.	*Gross tons.*	*Gross tons.*		
Iron ore	22,403,801	1,576,757	51,720,619	43.3	3.0
Coke	[3] 12,373,938	[3] 1,170,826	[3] 40,779,564	30.3	2.9
Pig iron	10,633,496	602,827	25,442,013	41.8	2.4
Ingots and castings	13,099,548	243,444	23,217,285	56.4	1.1
Rails	1,744,578	146,171	3,380,025	51.6	4.3

[1] For a statement of the capacity of the Tennessee concern, see Table 29, page 269.

[2] Annual Statistical Report of the American Iron and Steel Association, 1907, page 87.

[3] Net tons.

EVENTS LEADING TO THE ACQUISITION OF THE COMPANY.—This purchase of the Tennessee Coal, Iron and Railroad Company occurred in the midst of the panic of 1907. At that time conditions in the stock and money markets were exceedingly strained; there had been a very general suspension of cash payments throughout the country. It was stated at the time that several million dollars of the stock of the Tennessee concern had been used as collateral for loans by a large banking and brokerage house in New York City, which had also borrowed heavily on other securities. It has been asserted that this situation was taken advantage of by the financial interests back of the Steel Corporation to secure the property at what has been termed a "bargain-counter" price, or, in other words, at virtually a forced sale. The Corporation, on the other hand, has asserted that it really did not particularly desire the property, but that the transfer of its control to the Steel Corporation was sought by others chiefly with a view to relieving the brokerage house in question, and the financial situation generally at the same time, and that it paid a fair price for the stock. The terms on which the Corporation obtained control of this company are discussed below. (See p. 289.)

The situation at this time was so unusual, and the evidence concerning this transaction so extremely conflicting, while, furthermore, the entire situation has been so extensively reviewed in a public way, that a survey of the circumstances need not be undertaken at the present time.

The acquisition of the Tennessee Coal, Iron and Railroad Company made the Steel Corporation the most important single factor in the southern iron region. Moreover, of course, it prevented rival interests from using the Tennessee concern as a nucleus for a formidable consolidation in the South which might oppose the Corporation. It is worth noting, in this connection, that the acquisition of the Tennessee company by the Steel Corporation followed efforts at such a merger of the former concern with the Sloss-Sheffield Steel and Iron Company (see p. 94), which had extensive furnace interests, in addition to large reserves of ore and coal, and the Republic Iron and Steel Company, which had important investments in the Alabama district, in addition to its extensive properties in the North. Plans for such a merger apparently were carried at one time far toward consummation, but were not completed.

II. ACQUISITION OF ADDITIONAL ORE AND COAL PROPERTIES.

Section 6. Acquisitions of ore property prior to the lease of the Great Northern holdings.

The United States Steel Corporation since its organization has repeatedly added to its holdings of ore property. As just shown, very extensive additions to its ore reserves were effected through the purchase of the Union-Sharon, Clairton, and Tennessee Coal, Iron and Railroad companies. A very large amount of ore property acquired by the Corporation, however, has been picked up in small parcels, and, moreover, at relatively small initial expense, owing to the usual practice of securing it on a royalty basis instead of by outright purchase in fee. No detailed description of these miscellaneous additions is necessary at this time. Two ore properties acquired by the Corporation prior to 1906, however, are of sufficient importance to warrant brief mention. These are the Chemung and Canisteo holdings, both on the Mesabi Range.

Lease of Chemung iron ore properties.—The holdings of the Chemung Iron Company were secured by lease in August, 1903. The ore deposit was estimated to amount to as much as 70,000,000 tons, mostly of Bessemer grade.

Lease of Canisteo Mining Company.—The ore holdings of the Canisteo Mining Company, located in Itasca County, Minn., were leased by the Steel Corporation in 1905. In addition to the royalty the Steel Corporation paid a bonus of $500,000 in cash.

The lease covered nearly 500 acres, and the deposit was estimated at over 100,000,000 tons. On this basis the bonus was equivalent to only about one-half cent per ton. The estimates of this ore body have, moreover, since been considerably increased. The ore in this tract, however, requires concentration.

Other specific acquisitions of mining property which may be noted in passing were the fee of the Wick mine, acquired in 1902 for $165,000. In 1904 the Arcturus mine was acquired at a royalty of 25 cents per ton plus a bonus of $100,000. The ore from this mine is sandy and has to be washed before shipment. The tract was a large one, with an estimated ore body of upward of 12,000,000 tons, so that the initial investment of the Steel Corporation (which is expressed by the bonus) was less than 1 cent per ton. In 1905 the Whiteside mining lease was acquired at a bonus of $100,000.

Section 7. Lease of ore properties from the Great Northern system.

The various acquisitions of ore properties in the Lake Superior region just described were, however, completely overshadowed in 1907, when the United States Steel Corporation leased a large part of the most valuable ore lands of the Great Northern Railway system. By this transaction the Steel Corporation acquired control of ore reserves generally estimated from 400,000,000 to 500,000,000 tons, while more liberal estimates were nearly double these figures. Owing to the great importance of this transaction and its many distinguishing features, a brief account of it is desirable.

The nucleus of the ore holdings of the Great Northern system was the so-called Wright & Davis ore property in St. Louis and Itasca counties, Minn. This included also a lumber railroad—the Duluth, Mississippi and Northern—which had extensions to the mining properties discovered on this tract.

This entire Wright & Davis property, including the railroad and certain timber and timber contracts, was sold early in 1899 to the Eastern Railway of Minnesota, a subsidiary of the Great Northern. The total consideration, as given in trade journals at the time, and apparently on reliable authority, was about $4,300,000. This was generally conceded to be a conservative valuation.

These Great Northern ore lands apparently were not taken into consideration at the formation of the United States Steel Corporation in April, 1901. Not long after this, however, rumors became current that the Steel Corporation desired to secure this ore property. As early as 1903 the trade journals were talking of the probable consummation of negotiations between J. J. Hill and the Steel Corporation for a lease of these ore lands. It was reported at the time that Mr. Hill was demanding a guaranty that the Great Northern should receive $1.80 per ton of ore delivered at Lake Superior, this covering 80 cents for freight and $1 for the royalty. The deal, however, was not consummated at this time.

Mr. Hill, acting for the Great Northern system, continued to pick up parcels of ore property in the Mesabi region until by 1906 he had acquired in all more than 65,000 acres, containing hundreds of millions of tons of ore.

On January 2, 1907, 39,296 acres of these Great Northern ore lands were leased to the Great Western Mining Company, a subsidiary of the United States Steel Corporation, the performance of the stipulations of the lease being guaranteed by the Steel Corporation.[1]

The Great Northern interests had also leased to various parties prior to December 7, 1906, 1,597 acres, leaving, after taking into account this lease to the Great Western Mining Company, a balance of 24,200 acres, which were not leased by the Great Northern to anyone. It will be noted, therefore, that the United States Steel Corporation's leasehold interest covered only about 60 per cent of the total ore lands of the Great Northern interests.

Terms of the lease.—The lease provides that the Great Western Mining Company (Steel Corporation) shall mine, and ship via the Great Northern, a certain minimum tonnage yearly, this minimum increasing from 750,000 tons in 1907 to 8,250,000 tons in 1917, after which it is to remain fixed at that figure until the expiration of the lease, as follows:

	Tons.		Tons.
1907	750,000	1913	5,250,000
1908	1,500,000	1914	6,000,000
1909	2,250,000	1915	6,750,000
1910	3,000,000	1916	7,500,000
1911	3,750,000	1917[2]	8,250,000
1912	4,500,000		

In the event of the Great Western Mining Company failing to mine and ship the required minimum quantity in any year, it nevertheless is to make payment for the full amount of the stipulated minimum. On the other hand, the Mining company is to be allowed certain credits in case its shipments in other years exceed the minimum; also, should it be found impossible economically to produce 750,000 tons of ore during the year 1907, the Mining company was to be relieved of that portion of the minimum represented by this deficiency, a corresponding addition, however, to be made to the stipulated amounts to be mined during the years from 1908 to 1916.[3]

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[1] The character of ownership or control by the Hill interest of this 39,296 acres was as follows:

	Acres.
Owned in fee	19,934
Owned in fee, jointly with other parties (of which the Great Northern's interest was 7,915 acres)	15,972
Held by lease	3,390
Total	39,296

[2] And each year thereafter.

[3] Of the stipulated minimum of 750,000 tons for 1907, only 137,000 tons were actually mined. This tonnage, moreover, was produced by the Hill interests, who turned the profits over to the Steel Corporation in return for the payment by them of the stipulated royalty. There was a provision in the lease for deferring payment of the royalties for the year 1907 to any date prior to January 1, 1917, which the Steel Corporation might find convenient, but in the case of such delay the Steel Corporation was to pay the royalty stipulated in the lease for the year in which payment was made; that is, if payment were made in 1908 there would be an increase of 3.4 cents per ton, and a corresponding increase if payment were made in a subsequent year. (See p. 262.)

The Great Western Mining Company mines the ore and delivers it to the Great Northern Railway at the nearest convenient point for transportation to Superior, Wis., where it is delivered to the lessees on board ships at the docks.

The lease as to the lands owned in fee by the Great Northern (see note, p. 261) is to continue until the Great Western Mining Company (Steel Corporation) has mined all ore containing 49 per cent or over of metallic iron, and upon the exhaustion of ore of such grade the lease is to be extended so long as the Steel Corporation desires to mine such ore as remains. As to the leasehold properties (subleased to the Great Western Mining Company by the Hill interests), the term of the sublease in each case was to be the same as that in the original leases, less a period of three months.

It should be noted that the Steel Corporation has the privilege of relinquishing the entire lease on January 1, 1915, on giving two years' written notice of such intention.

Dried ore containing 59 per cent of metallic iron is the standard on which royalties are computed. For ore of this grade delivered at the dock at Superior, Wis., the royalty and transportation charges combined were fixed for the year 1907 at $1.65 per ton. A differential of 4.82 cents per ton on or off this base price was established for each increase or decrease of 1 per cent in the amount of metallic iron in the ore (from ore of from 49 to 66 per cent, inclusive), as follows:

Iron content.	Combined royalty and transportation (per ton, 1907).	Iron content.	Combined royalty and transportation (per ton, 1907).	Iron content.	Combined royalty and transportation (per ton, 1907).
Per cent.		*Per cent.*		*Per cent.*	
49	$1.1680	55	$1.4572	61	$1.7464
50	1.2162	56	1.5054	62	1.7946
51	1.2644	57	1.5536	63	1.8428
52	1.3126	58	1.6018	64	1.8910
53	1.3608	[1] *59*	[1] *1.6500*	65	1.9392
54	1.4090	60	1.6982	66	1.9874

[1] Base.

Should the Mining company desire to mine and ship ore running less than 49 per cent in iron content, the total consideration is to be $1.10 per ton, this covering the delivery at dock at Superior, Wis.

The lease further provides that the royalty on the different grades of ore from 49 per cent and upward shall increase by 3.4 cents per ton each year during the life of the lease.

The freight rate for ore on this railroad from the mines to Lake Superior has always been at a flat rate of 80 cents per gross ton. Therefore, of the total consideration—$1.65 per gross ton—for 59 per cent ore in 1907 stipulated in this lease, 85 cents represents the mining royalty proper. The increase of 3.4 cents per ton in each succeeding year, it will be seen, is exactly 4 per cent of 85 cents. For ore of the other grades specified the annual increase in the royalty is the same, namely, 3.4 cents per ton; consequently, the percentage of increase for the lower grades is more than 4 per cent and that for the higher grades less.

Mr. Hill, of the Great Northern, has been quoted as saying of the quantity of ore covered by the lease, "experts have figured it from 400,000,000 to 600,000,000 tons, but it would not be surprising if operations would uncover 1,000,000,000 tons."

The unusual character of this lease and the apparent reasons why it was entered into are discussed elsewhere. (See Chap. VI, p. 318.)

Section 8. Acquisitions of coal and coke property since 1901.

LEASE OF POCAHONTAS COAL AND COKE PROPERTIES.—Since its organization the Steel Corporation has made very substantial additions to its holdings of coal and coke property. In December, 1901, it secured a lease of 50,000 acres of desirable coking-coal and fuel-coal property in the Pocahontas coal region. The preliminary report of the Steel Corporation for that year stated that with this acquisition it was estimated that there was controlled by the subsidiary companies "a sufficient quantity of the best and cheapest coking coal to provide, on the basis of present consumption, for the necessities of all the furnaces of these companies during the next sixty years." The royalty was at the rate of 10 cents per gross ton of coal, or 15 cents per gross ton of coke. These were the usual rates of royalty in leases of coal lands in the Pocahontas district. The charge of 15 cents per gross ton of coke is equivalent to 13.4 cents per net ton, the unit commonly used in stating coke tonnages. The lease provided for the erection by the lessee of 1,000 coke ovens in the year 1902 and an additional 1,000 ovens in the years 1903 and 1904. The property is operated by the United States Coal and Coke Company, a subsidiary concern of the Illinois Steel Company.

OTHER IMPORTANT ACQUISITIONS OF COAL AND COKE PROPERTY.—In 1902, as already shown, the Steel Corporation acquired a considerable amount of valuable coal and coke property through its purchase of the Union Steel Company (already described in sec. 2). The purchase of the Clairton Steel Company, in 1904, included approximately 2,650 acres of coal lands in Fayette County, Pa.

In April, 1905, an important addition to the Corporation's coal and coke property was made through the purchase by the H. C. Frick Coke Company of the Hecla Coke Company, which had 1,072 beehive ovens, and which held a lease on about 1,200 acres of desirable coking-coal land in the Connellsville region. In the same year the H. C.

Frick Coke Company also acquired a tract of 1,126 acres of coking-coal land in the same region at about $800 per acre.

A tract of about 640 acres of coking-coal land in the Connellsville region was acquired in 1906. In 1907 an enormous addition to the coal property of the Corporation and a very important addition to its coke property were made through the acquisition of the Tennessee Coal, Iron and Railroad Company, already described in detail in section 5. In the same year an additional interest of 36.4 per cent of the Hostetter-Connellsville Coke Company, of which the Steel Corporation had previously owned one-half, was secured. The Hostetter-Connellsville coke property included 700 coke ovens and approximately 1,000 acres of coal lands in the Connellsville region.

In 1909 and 1910 the Corporation acquired very extensive coal properties in Illinois and Indiana.

An exceptionally important addition to the Corporation's coal property was made in June, 1911, through the purchase from the Pittsburgh Coal Company of about 7,000 acres of coking-coal property, known as the Colonial Coke Company tract, this being improved property; also about 9,000 acres of virgin or unimproved tracts of coal rights owned by the Monongahela River Consolidated Coal and Coke Company, the control of which is held by the Pittsburgh Coal Company. The total consideration was reported at approximately $17,800,000, in the form of 5 per cent thirty-five-year guaranteed bonds. According to a statement issued by the Pittsburgh Coal Company interests, the developed coking-coal lands, which included about 1,000 coke ovens, were transferred at an average consideration of $1,450 per acre, and the rights to the undeveloped coal property at $850 per acre.

III. ADDITIONS TO STEEL CORPORATION'S PROPERTY THROUGH NEW CONSTRUCTION.

Section 9. The Gary, Ind., plant.

Very important additions to the physical properties of the Steel Corporation have been made through new construction. The organization of the company had hardly been perfected when important plans were made for the extension and modernization of its manufacturing plants. A formal announcement in April, 1902, stated that the aggregate of such contemplated expenditures was in the neighborhood of $50,000,000, which it was proposed to secure through a bond issue in connection with the conversion of a portion of the preferred stock into funded debt. This plan, which is discussed elsewhere (see Chap. VIII), was delayed by litigation and was never carried out in its entirety. Nevertheless, the Corporation's earnings permitted the expenditure of large sums for construction.

The most important single piece of new construction was the erection of a new plant at Gary, Ind., through the Indiana Steel Company, a subsidiary concern of the Federal Steel Company.

The annual report of the Steel Corporation for 1905 contained the following reference to this plant:

> Although the capacity of the producing furnaces and mills located at Chicago and vicinity has been materially increased from time to time, it has not kept pace with the increased, and rapidly increasing, consumption tributary to this location; and therefore a large percentage of this tonnage is now supplied from eastern mills. In consequence of these conditions it has been decided to construct and put into operation a new plant to be located on the south shore of Lake Michigan, in Calumet Township, Lake County, Ind., and a large acreage of land has been purchased for that purpose.

The annual report for 1906 stated that about 7,500 acres of land had been acquired for the plant, for the city of Gary, and for railroad terminals. At that time the appropriations comprehended a plant of 8 blast furnaces, with the most modern equipment for unloading and handling ore, 56 open-hearth furnaces, blooming mill, rail mill, various finishing mills and auxiliary plants, as well as a harbor and docks. The expenditure contemplated for the work definitely decided upon up to that time was $40,000,000, not including nearly $5,000,000 which had already been expended in 1906. It was stated that the plant would ultimately have an annual capacity of 1,750,000 tons of finished steel.

The annual report of the Steel Corporation for 1910 showed that almost $70,000,000 had been expended on this Gary plant up to the close of that year, as follows:

For real estate and for development and construction work in the city of Gary, less credits for lands, lots, and houses sold	$10, 509, 325. 07
For construction of the manufacturing plants	53, 785, 876. 83
For terminal railroad work	5, 683, 493. 25
Total	69, 978, 695. 15

The same report of the Corporation, in describing the progress of the work on the Gary plant, contained the following:

> The construction and development work at Gary, Ind., progressed continuously and satisfactorily during the year 1910. At the steel plant of the Indiana Steel Company 6 of the 8 blast furnaces constructed have been satisfactorily operated. Of the three units constructed, each comprising fourteen 65-ton open-hearth furnaces, two units have been in operation. The rail mill has been in operation since February 17, 1909; the billet mill since August 16, 1909; the 18-inch merchant bar mill since December 16, 1909, and the 14-inch merchant mill since April 1,

> 1910. The axle plant is completed; the 160-inch plate mill will be ready for operation by April 1, 1911, and the three remaining merchant bar mills by May 1, 1911. Since the publication of the last annual report the construction of a continuous sheet bar mill was started. This mill will supply sheet bars for the sheet plant being constructed at Gary by the American Sheet and Tin Plate Company, a subsidiary of this Corporation. The new bar mill will be ready for operation by July 1, 1911. The by-product coke plant, construction of which was begun in June, 1909, is rapidly nearing completion, and it is expected the first battery of ovens will be placed in operation on or before April 1, 1911. This plant will have a total of 560 ovens of the Koppers type, and an annual capacity of about 2,500,000 tons. A gas-distributing system is being installed, by which all of the excess gas from the coke-oven plant will be utilized in the mill operations.
>
> The output of the Gary steel plant, of the Indiana Steel Company, in 1910, was as follows: 729,072 tons of pig iron, 1,006,252 tons open-hearth ingots, 435,142 tons open-hearth steel rails, and 340,993 tons of shapes, merchant bars, and miscellaneous steel products.

The construction of this great plant at Gary is of especial interest because it was entirely new and built as a model plant with the most modern equipment. A special feature of the plant is the large number of departments for the production of finished materials, such departments, as the foregoing excerpt indicates, being operated by the respective subsidiary concerns of the Steel Corporation. Two other noteworthy features of this Gary plant are the use of gas engines for the blast furnaces and the exclusive use of open-hearth furnaces for the production of steel.

Section 10. Other important additions to plants through new construction.

Other additions to the plants of the Steel Corporation through direct construction, as distinct from purchase, which are worthy of special mention, were the erection of two new blast furnaces and of mills for the manufacture of skelp and tubes by the Lorain Steel Company, at Lorain, Ohio; the construction of a new bridge plant by the American Bridge Company, at Ambridge, Pa.; the virtual reconstruction of the extensive McKeesport works of the National Tube Company; the construction of a steel plant at Duluth, Minn., and the addition of very important cement works under the control of a subsidiary concern, the Universal Portland Cement Company.

The Lorain tube plant involved a large expenditure. In 1904 more than $5,500,000 was expended on blast furnaces, with ore-handling machinery, skelp mills, and pipe and tube mills for this plant, while nearly $2,000,000 additional was later expended in completing it.

The reconstruction of the McKeesport works of the National Tube Company involved an expenditure of several millions of dollars.

This is of some interest in view of the fact that it had been supposed that the plant was in first-class shape. The National Tube Company, it will be recalled, was one of the most prosperous of the various steel consolidations operating in the period just preceding the organization of the Steel Corporation. (See p. 143.)

Duluth steel plant.—The annual report of the Steel Corporation for 1910, in referring to this plant, said:

> Reference was made in the annual report for 1907 to the acquirement of a site for and the proposed construction of a moderate-sized steel plant at Duluth, Minn. During 1908 and 1909 the work done in connection with this proposition consisted only of preparing the site for the steel plant, the acquirement of right of way for and some construction work on the terminal railroad connecting the proposed steel plant with all trunk lines entering Duluth. In the early part of 1910 construction work was actively undertaken on both the steel plant and railroad. During the year 1910 a total of $1,715.517.70 was expended on these properties. It is expected that further construction will be prosecuted during 1911. The plant as proposed will include the following producing departments: Two blast furnaces, 7 open-hearth steel furnaces, one 40-inch blooming mill, one 28-inch and 18-inch rail and bar mill, 16-inch, 12-inch, and 8-inch merchant mill, and by-product coke plant of 90 ovens, together with the necessary complement of auxiliary departments, such as power plants, pumping stations, machine and other shops, etc.

This Duluth steel plant is owned by a subsidiary corporation formed for the purpose, the Minnesota Steel Company, with an authorized capital stock of $1,000,000 owned by the Federal Steel Company.

Portland cement business.—The Portland cement business of the Steel Corporation has been very greatly extended. The manufacture of Portland cement as a by-product from blast-furnace slag had been prosecuted in a modest way by the Illinois Steel Company by the time the Steel Corporation was organized. The company's production rapidly increased, exceeding 1,700,000 barrels in 1905 as against 260,000 barrels in 1901.

This development of the cement business led to the organization on October 1, 1906, of a new subsidiary company, the Universal Portland Cement Company, which took over the plants previously owned by the Illinois Steel Company, including a new plant at Buffington, Ind., and which also commenced the construction of additional works at Universal, Pa., and elsewhere, with the result that in 1910 the Corporation's output had increased to over 7,000,000 barrels. The capacity at the close of 1910, including that of new works under way, was given in the annual report of the Corporation for that year at 12,000,000 barrels yearly.

It may be noted that this development of the cement business was a logical accompaniment of the steel business, since, on account of the increasing use of concrete construction, there was a very great demand for cement in the erection of buildings and for various other construction operations which also required large quantities of structural steel and merchant bars.

In addition to these conspicuous instances of new construction, the Steel Corporation, of course, made a very great number of extensions and enlargements at different points. Indeed, these scattered instances of enlargement were in the aggregate probably much more important than the few exceptional instances specifically mentioned here.

ADDITIONS TO OTHER PROPERTY.—The company made large additional investments in its transportation properties. As a rule these comprised normal extensions and improvements rather than new undertakings of exceptional interest. Mention may, however, be made of the construction of a branch line by the Duluth, Missabe and Northern from Alborn to Coleraine, Minn., a distance of 53 miles, connecting with the Canisteo and other mines developed on the western end of the Mesabi Range; the construction of the Connellsville Central line in the coal regions, the name of which was afterwards changed to Connellsville and Monongahela Railway; and the construction of the Newburg and South Shore Railway, a comparatively short line, at Cleveland. Considerable additions were made to the equipment of the Steel Corporation's various railroads, and also to its dock facilities at various points on the Lakes. The steamship property of the Corporation also has been greatly added to, not so much in the number of vessels as in the substitution of new vessels of large capacity and most modern equipment for older and smaller vessels acquired in 1901.

Section 11. Plant capacity of United States Steel Corporation.

INCREASES BY ACQUISITIONS AND BY NEW CONSTRUCTION DOWN TO THE CLOSE OF 1910.—An idea of the relative importance of the additions to the manufacturing capacity of the iron and steel plants of the Steel Corporation by the various acquisitions described in this chapter, and new construction, down to the close of 1910 is afforded by the following table, compiled from official figures:

TABLE 29.—ADDITIONS TO MANUFACTURING CAPACITY OF STEEL CORPORATION BY PURCHASE OF COMPETING CONCERNS AND BY NEW CONSTRUCTION, APRIL 1, 1901, TO JANUARY 1, 1911.

[NOTE.—The capacity figures below are based on the assumption that every department will be operated to its maximum capacity during the entire year, subject only to normal shutdowns for ordinary repairs and overhauling. All tonnage figures shown are gross tons. Percentages which are based on original capacity in 1901, were computed by Bureau.]

Product.	Capacity, Apr. 1, 1901.	Additions.								Capacity Jan. 1, 1911.
		By purchase of Union, Clairton, and Shelby Steel Tube companies.[1]		By purchase of T. C., I. and R. R. Co.		By new construction and improvements.		Total additions.		
	Tons.	*Tons.*	*P. ct.*	*Tons.*	*P. ct.*	*Tons.*	*P. ct.*	*Tons.*	*P. ct.*	*Tons.*
Blast-furnace products	7,440,232	1,228,000	16.5	1,000,000	13.4	6,572,468	88.3	8,800,468	118.3	16,240,700
Steel ingots	9,425,408	1,258,400	13.3	500,000	5.3	6,855,192	72.7	8,613,592	91.3	18,039,000
Rolled and other steel and iron products for sale	7,719,022	1,105,429	14.3	400,000	5.2	5,322,885	69.0	6,828,314	88.5	14,547,336
	Barrels.					*Barrels.*		*Barrels.*		*Barrels.*
Universal Portland cement	450,000	....	......	....	......	7,600,000	1,688.9	7,600,000	1,688.9	8,050,000

[1] Also includes the small capacity added through purchase of Troy Steel Products and Trenton Iron companies. It may be noted that while the Shelby Steel Tube Company has elsewhere been considered as one of the constituent concerns, it is here treated for convenience as a subsequent acquisition.

This table shows at a glance that the additions to plant capacity through the purchase of competing concerns have been greatly overshadowed by those effected through new construction. Thus, the total addition to blast-furnace capacity by the Union, Clairton, Shelby, and Tennessee concerns combined was a little less than 30 per cent of the Corporation's original capacity in April, 1901, whereas the additions through new construction during this period exceeded 88 per cent. Similarly, the additions to steel-ingot capacity (this covering three concerns, the Shelby concern having no steel works) aggregated less than 19 per cent as against an addition of nearly 73 per cent through new construction. The increase in capacity of the rolling mills by these three acquisitions was nearly 20 per cent, whereas the increase due to new construction was 69 per cent.

In addition to these increases in the capacities of iron and steel works proper down to the close of 1910, the Corporation had increased its capacity for the production of cement from 450,000 barrels to over 8,000,000 barrels (not including the capacity of new works under construction).

Section 12. Production and volume of business of the Steel Corporation, 1901–1910.

The actual production of the Steel Corporation, as distinct from its capacity, for the entire period 1901–1910, is given in Table 30.[1]

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[1] The relation of the Corporation's production to the country's total is discussed in Chapter IX.

TABLE 30.—COMPARATIVE STATEMENT OF PRODUCTION OF UNITED STATES STEEL CORPORATION, 1901-1910.

[Figures are for gross tons except for coke, which are net tons.]

Products	[1] 1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	Increase, 1901-1910.	
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Per cent.*
Iron ore mined:												
In Lake Superior region—												
Marquette Range	1,340,035	1,487,370	1,412,402	934,512	1,359,722	1,442,290	1,170,496	830,087	899,002	830,094	[2] 509,941	[2] 38.05
Menominee Range	2,090,976	2,675,754	2,106,443	1,186,104	1,871,979	1,874,680	1,625,358	1,021,598	1,359,415	1,384,465	[2] 706,511	[2] 33.79
Gogebic Range	1,665,140	2,064,492	1,867,856	1,271,831	1,671,747	1,465,375	1,425,457	1,078,025	1,312,701	1,801,480	136,340	8.19
Vermilion Range	1,805,997	2,057,537	1,918,584	1,056,430	1,578,626	1,794,186	1,724,217	927,206	1,066,474	1,338,110	[2] 467,887	[2] 25.91
Mesabi Range	6,121,607	7,778,026	[illegible],058,070	6,054,210	12,004,482	14,068,617	16,458,273	11,272,397	16,968,592	17,910,366	11,788,759	192.58
In Southern ore region—Tennessee Coal, Iron and Railroad Company's mines	....	....	....	....	....	....	....	1,533,402	1,824,863	1,981,301	1,981,301	....
Total	13,023,755	16,063,179	15,363,355	10,503,087	18,486,556	20,645,148	22,403,801	16,662,715	23,431,047	25,245,816	12,222,061	93.84
Coke manufactured:												
Beehive ovens	8,967,969	9,521,567	8,639,471	8,539,171	11,930,157	12,899,753	12,716,013	7,591,062	11,896,211	11,641,105	2,673,136	29.81
By-product ovens	....	....	18,920	113,122	312,752	395,322	828,751	578,869	1,693,901	2,008,473	2,008,473	....
Total	8,967,969	9,521,567	[illegible],658,391	8,652,293	12,242,909	13,295,075	13,544,764	8,169,931	13,590,112	13,649,578	4,681,609	52.20
Coal mined, not including that used in making coke	963,326	709,367	1,120,733	1,998,000	2,204,950	1,912,444	1,841,259	3,008,810	3,089,021	4,850,111	3,886,785	403.48
Limestone quarried	1,388,941	1,476,289	1,435,439	1,549,129	2,348,912	2,737,375	3,926,879	3,041,579	4,715,708	5,005,087	3,616,146	260.35
Blast-furnace products:												
Pig iron	6,662,862	7,802,812	7,123,053	7,210,248	9,940,799	11,058,526	10,631,620	6,[illegible]10,831	11,436,570	11,645,510	4,982,648	74.78
Spiegel	132,940	128,265	121,779	100,025	158,071	150,044	130,554	74,716	80,942	102,260	[2] 30,680	[2] 23.08
Ferromanganese and silicon	59,929	44,453	34,409	59,148	73,278	58,807	57,794	48,861	100,838	83,628	23,699	39.54
Total	6,855,731	7,975,530	7,279,241	7,369,421	10,172,148	11,267,377	10,819,968	6,934,408	11,618,350	11,831,398	4,975,667	72.58

Steel-ingot production:												
Bessemer ingots	6,109,306	6,759,210	6,191,660	5,427,979	7,379,188	8,072,655	7,556,460	4,055,275	5,846,300	5,796,223	[2] 313,083	[2] 5.12
Open-hearth ingots	2,745,514	2,984,708	2,976,300	2,978,399	4,616,051	5,438,494	5,543,088	3,783,438	7,508,889	8,383,146	5,637,632	205.34
Total	8,854,820	9,743,918	9,167,960	8,406,378	11,995,239	13,511,149	13,099,548	7,838,713	13,355,189	14,179,369	5,324,549	60.13
Rolled and other finished steel products for sale:												
Steel rails	1,652,517	1,920,786	1,934,315	1,242,646	1,727,055	1,982,042	1,733,814	1,050,389	1,719,486	2,118,473	465,956	28.20
Blooms, billets, slabs, sheet and tin plate bars	1,068,522	782,637	493,292	932,029	1,253,682	1,096,727	758,699	551,106	675,614	682,364	[2] 386,158	[2] 36.14
Plates	567,357	649,541	519,713	404,422	780,717	836,399	877,682	312,470	729,790	929,020	361,663	63.74
Heavy structural shapes	....	....	362,765	313,779	484,048	620,823	587,954	313,733	614,971	656,797	1,159,266	11[illegible].10
Merchant steel, skelp, hoops, bands, and cotton ties	1,025,037	1,254,560	634,830	577,384	982,782	1,240,548	1,316,387	577,591	1,290,467	1,527,506		
Tubing and pipe	583,504	664,341	710,555	710,765	911,346	1,025,913	1,174,629	654,428	1,013,071	868,550	285,046	48.85
Rods	94,145	109,330	101,699	84,934	84,049	111,488	126,095	93,406	139,149	133,722	39,577	42.04
Wire and products of wire	1,048,661	1,122,809	1,126,605	1,226,610	1,283,943	1,399,717	1,481,226	1,275,785	1,607,689	1,490,[illegible]18	441,657	42.12
Sheets—black, galvanized, and tin plate	696,784	699,621	763,670	735,482	924,439	1,112,542	1,070,752	770,321	1,024,985	1,082,787	386,003	55.40
Finished structural work	411,948	481,029	469,692	357,488	404,732	643,622	719,887	403,832	530,766	589,228	177,280	43.03
Angle and splice bars and other rail joints	154,165	139,954	138,709	72,470	150,265	176,730	195,157	84,669	190,22[illegible]	235,998	153,159	99.34
Spikes, bolts, nuts, and rivets	....	42,984	53,259	46,003	61,496	70,233	67,991	40,252	71,881	71,326		
Axles	99,800	136,787	119,716	62,981	149,596	181,91[illegible]	189,006	24,057	68,366	101,066	1,266	1.27
Steel car wheels	....	....	....	....	....	....	....	7,223	67,985	98,105	98,105	....
Sundry steel and iron products	24,040	29,177	30,059	25,787	28,23[illegible]	79,736	77,463	47,670	115,214	148,735	124,695	518.70
Total	7,42[illegible],480	8,033,556	7,458,879	6,792,780	9,226,386	10,578,433	10,37[illegible],742	6,206,932	9,859,660	10,733,9[illegible]	3,307,515	44.54
Spelter	22,989	23,982	23,841	29,983	29,781	28,884	31,454	28,057	27,853	26,777	3,788	16.48
Sulphate of iron	11,936	14,224	15,407	15,805	20,040	21,933	24,540	26,411	33,582	33,684	21,748	182.21
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	
Universal Portland cement	261,712	486,357	644,286	539,951	1,735,343	2,076,000	2,129,700	4,535,[illegible]00	5,786,000	7,001,500	6,739,788	2,575.27

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[1] The 1901 figures, which were furnished directly by the Corporation, cover the production of the subsidiary companies for the full year and not merely for the nine months April to December. Most of the figures were taken from the annual reports, subject to some revisions made by the Corporation.

[2] Decrease.

It is apparent, therefore, that there has been a very great expansion of the production of the Steel Corporation in practically every important department. Thus, in the case of ore the total production increased from 13,023,755 tons in 1901 to 25,245,816 tons in 1910, the highest for any year.

The increase in coke production was from 8,967,969 tons in 1901 to 13,649,578 tons in 1910, the production of the latter year, as in the case of ore, being the high-record figure.

The production of pig iron (not including spiegel, ferromanganese, etc.) increased from 6,662,862 tons to 11,645,510 tons, the 1910 figures again being the highest yet recorded, although in 1906 and 1909 the production exceeded 11,000,000 tons.

The production of steel ingots increased from 8,854,820 tons in 1901 to 14,179,369 tons in 1910, the production of the latter year being well in excess of the previous high-record figure (reached in 1906). It is important to call attention in this connection to the very great increase in the production of open-hearth steel, which rose from slightly less than 2,750,000 tons in 1901 to over 8,380,000 tons in 1910. The production of Bessemer steel, on the other hand, shows an absolute decrease during this period, from 6,109,306, in 1901, to 5,796,223 tons in 1910. These figures well illustrate the transition that took place in the steel industry in this respect.

The percentage increases in the Corporation's production of the raw materials and in the primary products for the period 1901–1910, given in Table 30, compare as follows:

Iron ore	93.8	Pig iron	74.8
Coke	52.2	Ingots	60.1

With respect to finished rolled products for sale the increase in production has been much less marked, the actual increase being from 7,426,480 tons in 1901 to 10,733,995 tons in 1910, a gain of 3,307,515 tons, or 44.5 per cent.

Taking up these finished products in detail it will be seen that the output of steel rails in 1910 exceeded 2,100,000 tons as against a previous high-record figure (in 1906) of 1,982,000 tons. The 1910 figures include the production of both the new Gary plant and of the Tennessee Coal, Iron and Railroad Company.

It will be noted that the Corporation's output of tubing and pipe in 1910 was considerably smaller than the output of several preceding years. There was also some reduction in wire and wire products in 1910 as compared with the output in 1909. These decreases are apparently in part attributable to the increase in competition in these departments.

The great increase in the production of Portland cement has already been commented upon. It may be noted again that the production of 1910 of 7,000,000 barrels was very much less than the capacity of the Corporation's plants for this product, including new construction in progress at the close of 1910.

The ten-year period 1901–1910, while on the whole a distinctly prosperous one, included two years of marked depression, namely, 1904 and 1908. In these years there were pronounced declines in the Steel Corporation's output. The reaction of 1904 was especially reflected in the production of ore and finished steel; the production of pig iron in that year, on the other hand, showed a slight increase. The depression of 1908 was reflected in the figures of output in practically every important product except cement. Thus, the output of ore decreased over 5,700,000 tons; that of coke over 5,300,000 tons, while the pig-iron output fell off 3,800,000 tons; that of steel ingots by more than 5,200,000 tons, and finished steel production by more than 4,100,000 tons; moreover, these large decreases were shown in spite of the fact that the considerable production of the Tennessee Coal, Iron and Railroad Company was included in 1908 for the first time. The year 1909, it may be noted, however, brought a recovery in all the raw and crude products above the large production of 1907. The output of finished rolled products in 1909, however, was somewhat under the 1907 figures.

These comparisons illustrate the abrupt changes which characterize the iron and steel industry.

IV. PRESENT ORGANIZATION OF STEEL CORPORATION.

Section 13. Reorganization and coordination of the various constituent properties.

In connection with the various acquisitions and extensions described in this chapter, the Steel Corporation undertook a rather comprehensive rearrangement of its principal subsidiary concerns so as to place those plants manufacturing similar products, or those companies owning the same kind of property, under the control of certain principal constituent concerns. This rearrangement obviously tended to facilitate a more efficient and economical operation of these properties. A particular advantage was the reduction in the number of high-salaried officials. As this rearrangement was generally accompanied by a considerable reduction in the capitalization of the subsidiary concerns, there was also some saving in taxes on capital stock.

Merger of old Carnegie, National Steel, and American Steel Hoop companies.—One of the most important of these rearrangements was the merger, on April 1, 1903, of the Carnegie Company of New Jersey, the National Steel Company, and the American Steel Hoop Company under the New Jersey charter of the National Steel Company, the name being changed, however, to Carnegie Steel

Company. The capital stocks of the three older concerns aggregated $252,000,000, as follows:

Carnegie Company	$160,000,000
National Steel Company	59,000,000
American Steel Hoop Company	33,000,000
Total	252,000,000

The capital stock of the new Carnegie Steel Company, however, was fixed at $63,000,000, or exactly one-quarter the total for the three older concerns combined. Apparently this capitalization was determined upon without reference to the value of the properties, but with a view to having a convenient basis for the exchange of the stocks of the three constituent companies. The reduction in capitalization permitted a considerable saving in annual taxes and in fees. The principal object of the consolidation, however, was to secure economies of management by reducing the number of high-salaried officials and by the simplification of accounts. Moreover, as above suggested, there was a practical advantage in having all of these concerns directed from a single source. The Carnegie Company and the National Steel Company, as already shown in this report, were large producers of pig iron and steel billets and other heavy steel products. The Carnegie Company, moreover, produced merchant bars and other products similar to those made by the American Steel Hoop Company. Most of the plants of the Steel Hoop company, it may be noted, were conveniently located in relation to the plants of the National Steel Company and the Carnegie concern, so that the consolidation resulted in very substantial advantages from an operating standpoint.

The plants of the old National Steel and American Steel Hoop companies are owned in fee by the Carnegie Steel Company of New Jersey. The old Carnegie plants are owned by the Carnegie Steel Company of Pennsylvania. (See Exhibit 7, p. 407.)

MERGER OF COKE PROPERTIES.—On the same date (April 1, 1903) the coke properties of the various subsidiary concerns of the Corporation were transferred to the H. C. Frick Coke Company, the capital stock of which was increased from $10,000,000 to $20,000,000. There had previously been some unification of the coke properties, but prior to this date the Steel Corporation had maintained several other subsidiary coke concerns, namely, the Southwest Connellsville Coke Company, which held the coke property of the Federal Steel Company; the American Coke Company, the coke concern of the American Steel and Wire Company; the Continental Coke Company, owning the similar properties of the National Steel Company; and the United Coal and Coke Company and the McClure Coke Company. These subsidiaries had virtually been managed through the H. C. Frick

Coke Company, but their formal transfer to that concern resulted in distinct advantages from an operating standpoint.

MERGER OF SHEET STEEL AND TIN PLATE COMPANIES.—On December 31, 1903, a further intercompany consolidation was effected through the purchase by the American Sheet Steel Company of all the property of the American Tin Plate Company. The name of the Sheet Steel company was changed to the American Sheet and Tin Plate Company. The capitalization of the Sheet Steel company was retained unchanged, but that of the American Tin Plate Company was reduced from $46,325,000 to the nominal figure of $25,000. The consolidation of these companies permitted much better coordination of sheet and tin-plate mills than was possible under their separate operation.

CONSOLIDATION OF TUBE WORKS.—Another similar instance of intercompany rearrangements was the placing of the plants of the Lorain Steel Company (at Lorain, Ohio, where a large tube plant was added) under the control of the National Tube Company.

MERGER OF ORE PROPERTIES.—In 1904 all the various ore properties of the Steel Corporation were placed under the active control of the Oliver Iron Mining Company.

LEASE OF UNION STEEL PROPERTIES.—Another intercompany rearrangement was the lease of the various properties of the Union Steel Company to other subsidiary concerns of the Corporation. Thus, the blast furnaces and the steel works were leased to the Carnegie Steel Company; the wire plants to the American Steel and Wire Company. The organization of the Union Steel Company was preserved, however, and the revenue from these leases went into its treasury. The arrangement, however, relieved the Union Steel Company from the direct operation of these plants, and thus effected a substantial saving in salaries and other expenses, while further contributing to the systematization of the operation of the various properties.

ORGANIZATION OF EXPORT DEPARTMENT BY THE STEEL CORPORATION.—For some time after the organization of the Steel Corporation, each subsidiary company which had occasion to engage in export trade conducted its sales independently of the others. In the latter part of September, 1903, however, the United States Steel Products Export Company[1] was formed to look after the foreign trade of all the various subsidiary companies of the Steel Corporation. The new company acts as selling agent in the foreign trade for all the subsidiary concerns of the Steel Corporation. This organization of a special company was the result of an intention on the part of the Steel Corporation to develop the export trade more thoroughly. As a matter of fact, there was a marked increase in export business in 1904; this, however, was partly attributable to the depressed condition of the domestic market in that year, which naturally led to a more serious consideration of the possibilities of foreign markets. With the return of greater prosperity in the home market, the export business fell off somewhat.

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[1] The name was in 1910 changed to United States Steel Products Company. The company has a capital stock of $1,000,000 and is a subsidiary of the Federal Steel Company.

Creation of new subsidiaries.—As already pointed out, in the construction of its great plant at Gary the Steel Corporation organized a new subsidiary concern, the Indiana Steel Company, and similarly, in the case of its works at Duluth, it formed a local corporation, the Minnesota Steel Company. It also organized in 1907 the Great Western Mining Company to manage the ore properties controlled under the Hill lease. (See p. 260.) The incorporation of the Universal Portland Cement Company may also be mentioned in this connection. This creation of new subsidiary concerns is in line with the character of the Steel Corporation as a holding company.[1]

Section 14. Constituent concerns of Steel Corporation on July 1, 1911.

As a result of these various rearrangements and new acquisitions, the list of principal constituent concerns of the Corporation, the stocks of which were directly held by it on July 1, 1911, was as follows:

Table 31.—CONSTITUENT CONCERNS OF THE UNITED STATES STEEL CORPORATION WHOSE STOCKS WERE DIRECTLY HELD BY IT JULY 1, 1911.

Company.	Class of stock.	Total outstanding capital stock.	Amount owned by United States Steel Corporation.
Carnegie Steel Company of New Jersey		$65,250,000.00	$65,250,000.00
Federal Steel Company	Common	46,484,300.00	46,484,300.00
	Preferred	53,260,900.00	53,260,900.00
American Steel and Wire Company of New Jersey	Common	50,000,000.00	49,989,400.00
	Preferred	40,000,000.00	39,999,000.00
National Tube Company	Common	40,000,000.00	40,000,000.00
	Preferred	40,000,000.00	40,000,000.00
American Sheet and Tin Plate Company	Common	24,500,000.00	24,499,600.00
	Preferred	24,500,000.00	24,499,600.00
American Bridge Company, New Jersey		10,000,000.00	10,000,000.00
Shelby Steel Tube Company	Common	8,151,500.00	8,151,500.00
	Preferred	5,000,000.00	5,000,000.00
Lake Superior Consolidated Iron Mines		29,887,448.97	29,887,448.97
Pittsburg Steamship Company		7,880,000.00	[1] 221,700.00
Union Steel Company		20,000,000.00	20,000,000.00
Clairton Steel Company		3,500,000.00	3,500,000.00
Tennessee Coal, Iron and Railroad Company	Common	32,529,997.50	32,442,795.00
	Preferred	124,500.00	
	Guaranteed preferred.	178,600.00	

[1] The balance of the capital stock of Pittsburg Steamship Company ($7,658,300) is owned by Carnegie Steel Company.

It should be understood that the companies given in this list are simply the constituent concerns whose stocks are directly held by the

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[1] The stocks of all these new subsidiaries are owned by some of the constituent companies of the Corporation and not by the Corporation itself.

Steel Corporation, and that these constituent concerns, in turn, have a large number of subsidiary corporations, in addition to fee properties. A statement of the subsidiary companies of these constituent concerns is given in Exhibit 7, on page 407.

Several of these constituent companies, as well as many of their subsidiaries, had a large amount of indebtedness which is not here shown. A considerable part of this indebtedness was owned within the organization.

The Carnegie Steel Company, as already shown, was a merger of the old Carnegie Company of New Jersey, the National Steel Company, and the American Steel Hoop Company. The aggregate capital stock of these companies at that time was $252,000,000, whereas in the merger the capital stock was first fixed at $63,000,000. As a result of this reduction, the consolidated company entered surplus on its books to the amount of the capital stock thus extinguished, or $189,000,000.

The Carnegie Steel Company (the present company) subsequently increased its capital stock by $2,250,000, or, as the above table shows, to $65,250,000.

In the merger of the American Sheet Steel Company and American Tin Plate Company, as above shown, the capitalization of the old American Sheet Steel Company was continued unchanged, and that company entered on its books a surplus of $46,325,000, this being equal to the entire outstanding stock of the American Tin Plate Company.

The table shows that the present capitalization of the American Bridge Company of New Jersey is $10,000,000. This is a reduction of $52,324,600 from the previous capitalization. This amount, therefore, as in the case of the American Tin Plate and Carnegie companies, was written into the surplus account of the company.

These are the only instances of reductions in capital stock. It may be noted that the Union Steel Company's stock is $20,000,000. Most of the properties of this concern, as already stated, are operated by constituent or subsidiary companies of the Corporation. The stock of the Lake Superior Consolidated Iron Mines has been increased by $462,508 since the Steel Corporation was organized, this amount representing the treasury stock issued since the acquisition of the company by the Steel Corporation. The issued stock of the Pittsburg Steamship Company, which in 1901 was $1,330,000, has been increased to $7,880,000.

The one-sixth interest in the stock of the Oliver Iron Mining Company, which was subsequently acquired in 1901 (see p. 106), does not appear in this list for the reason that this fraction was transferred to the Carnegie Steel Company, which, therefore, now owns the entire stock of the Oliver concern.

CHAPTER VI.

ADDITIONS TO INVESTMENT OF UNITED STATES STEEL CORPORATION SINCE 1901.

Section 1. Introductory.

The valuation of $682,000,000 for the tangible property of the Steel Corporation at its organization in 1901, as computed in Chapter III, may fairly be regarded as substantially the *investment* in such tangible property of the Corporation at that time, reduced to a cash basis. In order to obtain an estimate of the investment in such tangible property of the Corporation at the present time, it is necessary to ascertain the actual cost of the net additions since the company's organization. These additions, as shown in the preceding chapter, have been made in two ways—first, through new construction and through other additions directly from earnings or from capital otherwise provided; and, second, through the acquisition of competing concerns. By combining the cost of these various additions to the property (after certain allowances for depreciation; see pp. 292–309) with the original investment in the property in 1901, as already computed, an approximate total of the actual *investment* in the physical property of the Corporation at the present time is obtained. The *value* of such property, and especially of the natural resources, is referred to later. For the purposes of the present discussion, however, and of judging the reasonableness of the profits of the Corporation, which are discussed in Chapter VII, a statement of the actual investment in, rather than the value of, its property is essential.

It should be pointed out that in addition to the tangible properties of the Steel Corporation, its intangible assets have a value. Indeed, the very merging and coordinating of the various tangible properties of the Corporation imparts to them collectively a value somewhat in excess of the sum of the values of their tangible assets alone. The Corporation, in fact, contends that this " merger value," as it may be termed, is a very important factor in its total assets. Since, however, this merger value must be partly due to the restriction or elimination of competition, and since the portion thus created can not be segregated from that due to the introduction of economies, it is impracticable in this discussion to make any quantitative allowance for merger value of any sort whatever. A brief consideration of this and similar factors is, however, taken up later. (See p. 326.)

There will first be considered here the additions directly made from earnings, or from new capital, and then the cost of additions made through acquisitions of other concerns.

Section 2. Cost of additions to Steel Corporation's property other than by purchase of competing concerns, 1901 to 1910, by classes.

The Steel Corporation in its annual reports gives a summary of those direct additions to fixed property for each year which are charged to capital account. This summary classifies such expenditures by the following kinds of property: Manufacturing, ore, coal and coke, transportation, miscellaneous.

In order to arrive at a statement of the total additions to the assets of the Corporation, account must, of course, be taken of the increase in other assets as well. These remaining assets are grouped in the balance sheets of the Corporation under the following heads: (1) Deferred charges to operations, representing chiefly advanced mining royalties; (2) investments; (3) sinking and reserve fund assets; (4) current assets, this including, in addition to the ordinary quick assets and inventories, sundry securities.

In the following table are given the yearly additions to the fixed property of the Corporation[1] (other than the original cost of the Union Steel Company, the Clairton Steel Company, and the Tennessee Coal, Iron and Railroad Company), together with the annual increases in its other assets, for the period from April 1, 1901, to December 31, 1910. For convenience in later discussion (see pp. 313–323) the total additions for the period 1901–1907 are also given.

It should be kept in mind that the additions to fixed property given in this table are gross amounts. Account must also be taken of the depreciation and exhaustion of the Corporation's properties during this interval. This matter is one of considerable intricacy. It is taken up in sections 5 and 6 of this chapter.

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[1] The additions to fixed property given in Table 32 are substantially identical with the figures given in the published reports of the Corporation. In a few cases, however, they differ, either as to the distribution of certain items which in the annual reports are given in a lump sum, or because of certain revisions made subsequent to their original publication.

TABLE 32.—ADDITIONS TO FIXED PROPERTY OF UNITED STATES STEEL CORPORATION THROUGH CAPITAL EXPENDITURES (EXCLUSIVE OF ORIGINAL COST OF UNION STEEL, CLAIRTON STEEL, AND TENNESSEE COAL, IRON AND RAILROAD COMPANIES), AND INCREASES IN OTHER ASSETS, 1901-1910.

[For certain adjustments on account of depreciation, see Tables 37 and 38. Italics indicate decreases.]

Class of property.	1901 (9 months).	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	Total, 1901–1907.	Total, 1901–1910.
Fixed property assets:												
Manufacturing properties[1]	$9,337,599	$9,972,514	$20,808,575	$12,191,596	$8,564,139	$12,895,066	$23,249,437	$14,480,566	$7,413,543	$11,316,379	$97,018,926	$130,229,414
Gary plant	....	....	....	....	....	4,720,159	19,343,229	18,733,841	11,108,615	16,072,851	24,063,388	69,978,695
Tennessee Coal, Iron and Railroad Company	....	....	....	....	....	....	984,887	3,460,993	3,174,350	3,887,079	984,887	11,507,309
Iron ore properties[2]	3,361,116	2,147,308	2,067,959	2,056,275	3,249,825	5,583,650	10,429,838	8,743,513	7,774,229	7,035,644	28,895,971	52,449,357
Coal and coke properties	1,175,164	2,043,169	4,047,879	1,490,502	4,178,986	1,089,379	4,093,284	1,938,402	4,085,886	2,499,887	18,118,363	26,642,538
Transportation properties	2,375,175	2,988,926	5,046,484	2,692,326	8,184,127	10,436,125	15,105,336	8,163,127	4,901,849	12,549,929	46,828,499	72,443,404
Miscellaneous fixed properties	659,433	*142,346*	746,960	265,034	1,949,477	344,782	181,308	315,898	153,772	497,045	4,004,648	4,971,363
Sundry adjustments[3]	*228,103*	691,496	237,502	*28,921*	646,213	84,823	614,723	*114,848*	*48,066*	1,208,770	2,017,733	3,063,594
Total fixed properties	16,680,384	17,701,067	[4]32,955,359	18,666,812	26,772,767	35,153,984	74,002,042	55,721,497	38,564,178	55,067,584	221,932,415	371,285,674
Assets other than fixed property:												
Deferred charges to operations[5]	*550,571*	*104,065*	543,655	263,693	756,984	1,074,899	1,932,112	2,901,932	3,656,525	2,568,514	4,116,707	13,243,678
Investments[6]	3,630,924	*1,997,082*	537,277	*491,973*	*739,833*	437,008	99,769	1,365,880	*729,890*	16,284	1,476,090	2,128,364
Sinking and reserve fund assets	245,080	1,143,543	2,218,58[illegible]	3,351,001	9,778,104	10,707,392	4,998,457	*9,179,367*	*1,524,082*	*5,671,048*	32,442,163	16,067,666
Net current assets[7]	3,886,455	26,897,361	11,062,345	*13,299,764*	29,110,576	31,014,835	6,451,586	*33,157,160*	33,683,11[illegible]	6,034,192	95,123,394	101,683,544
Total assets, other than fixed property	7,411,888	25,939,757	14,361,863	*10,177,043*	38,[illegible]05,831	43,234,134	13,4[illegible]1,924	*38,068,715*	35,085,671	2,947,942	133,158,354	133,123,252

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[1] Exclusive of Gary plant and the building of the city of Gary and terminal railroad work connected therewith, and expenditures on Tennessee Coal, Iron and Railroad Company's properties.

[2] Includes unabsorbed expenditures for stripping and development at mines which, while capitalized temporarily, are gradually absorbed in operating cost.

[3] Adjustments in sundry accounts not distributed by classes of property.

[4] In this year expenditures of $8,421,189 upon the Union Steel Company properties, not classified in the annual report for that year, have been properly distributed by classes.

[5] The Bureau excluded expenditures for stripping and development at mines which in the company's accounts were included under this head down to December 31, 1906. Such expenditures for stripping and development at mines are in this table included in all years under iron-ore properties. The "Deferred charges to operations," therefore, include chiefly advanced mining royalties.

[6] Outside real estate and investments in sundry securities, including real-estate mortgages and land-sale contracts. In the annual reports of December 31, 1902, and December 31, 1903, insurance fund and depreciation fund assets are included under this caption, whereas in the above table these amounts appear under "Sinking and reserve fund assets."

[7] Sundry real-estate mortgages and purchase-money obligations have not been deducted from the gross current assets in establishing these net figures. (See p. 201.)

Section 3. Cost of properties acquired through purchase of competing concerns.

The additions to fixed property, as above stated, do not include the original cost of the fixed properties of the Union, Clairton, and Tennessee Coal, Iron and Railroad companies, although they do include the subsequent capital expenditures upon these properties. In order to obtain a grand total of the additions to the property account of the Steel Corporation since its organization, therefore, it is necessary to add to these classified totals shown in the preceding table the original investment of the Corporation in the fixed properties of the three concerns named. The current assets of these concerns are included in the totals already given, since the Bureau's statement of such assets is made up directly from balance sheets of the Steel Corporation.

The Steel Corporation acquired a few other small concerns, such as the Troy Steel Products Company and the Trenton Iron Company. The cost of these acquisitions, however, is included in the yearly totals of capital expenditures given in Table 32, so that these minor purchases need not be considered separately.

In the case of the Union and Clairton steel companies, a distribution of the original cost by the principal classes of property was made by the Steel Corporation itself, as noted below. No such distribution, however, was made in the case of the Tennessee Coal, Iron and Railroad Company, and no classification need be made at the moment, since in the official estimate by the Steel Corporation of the value of its property at the close of 1907, already referred to, the property of the Tennessee concern is not so classified.

The cost of these three concerns may now be briefly analyzed.

Cost of Union-Sharon steel properties.—In payment for the Union Steel Company (which, it will be recalled, had just absorbed the Sharon Steel Company; see p. 252), the United States Steel Corporation guaranteed an issue of $45,000,000 of Union Steel Company bonds. Of this total, $29,113,500 were issued at the time for the property, $8,512,500 were sold to the vendors to be paid for in cash at par under the agreement, while $3,500,000 were reserved to retire bonds outstanding against the Sharon properties, and $3,874,000 were reserved for future construction and improvements.

The aggregate cost of the fixed properties was stated by the Corporation at $30,860,501. Payment was made in the following manner.

Bonds of the Union Steel Company (guaranteed by the United States Steel Corporation)	$29,113,500
Underlying bonds assumed	3,591,000
Cash	497,990
Total	33,202,490
Less liquid assets acquired	2,341,989
Total cost fixed properties	[1] 30,860,501

This total was allotted by the Corporation among the different classes of property acquired, as follows:

Manufacturing properties	$14,832,875
Coal and coke	6,104,207
Ore	8,550,607
Transportation	1,004,463
Miscellaneous	368,349
Total	30,860,501

The following is an excerpt from an official statement of the Corporation regarding the transaction:

> The Steel Corporation pay the exact cost of the manufacturing plants, to be determined by auditors appointed for that purpose. For the real estate, ore properties, and the coal lands they will pay something more than the cost value, but not to exceed the present market value. The stockholders of the Union and Sharon plants agree to furnish about $10,000,000 new cash, to be expended in the completion of improvements and further development of the properties in such manner as the Steel Corporation may determine.
>
> The manner of paying for the property will be by a bond issue of $45,000,000, secured on the property and the principal and interest guaranteed by the Steel Corporation. For the actual money put into the manufacturing property the stockholders will receive these bonds at par. For the value of real estate, ore, and coal they will receive bonds at par, and for the $10,000,000 of new cash they will receive bonds at par. The remainder of the bonds will be kept in the treasury for use at some future time in such further development of the property as may be decided on by the Steel Corporation.
>
> The sellers' profit in the transaction arises solely from their profit in operating their plants to date, and in the increased value of their ore, coal, and real estate, which were purchased some time ago.

There appears to be no reason to doubt the accuracy of the statement with respect to the manufacturing properties. It seems probable that the investment in these manufacturing plants reached the total of, roughly, $14,800,000, above stated. As previously shown in the discussion of the purchase of this concern, these properties were extensive. The combined blast-furnace capacity was about 2,500 tons daily, and the open-hearth furnace capacity was almost as large, while there was a large variety of finishing departments.

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[1] This total includes the cost of a minority interest in a subsidiary concern of the Sharon Steel Company. This parcel was purchased in 1903 and the cost is included in the additions for that year in Table 32. It is included here for convenience in discussion, but is not duplicated in the final computation. (See Table 33.)

This figure for the manufacturing plants includes the organization and capitalization expenses of the company, together with a little miscellaneous real estate. These items, however, were comparatively unimportant.

The value assigned to transportation property, roughly, $1,000,000, does not appear to be unreasonable. It covered the Mercer Valley Railroad, with 3 miles of main line and 30 miles of sidings about the works, and 2 steamers of 7,000 tons capacity each.

The miscellaneous property included some gas property and scattered real estate and tenements. The total amount assigned these properties is so small that it need not be analyzed.

Therefore, except for the values assigned ore, coal, and coke property, it appears that these figures of cost may be accepted as a fairly accurate measure of the value of these Union Steel properties at the time of the transfer.

As shown above, the coal and coke property went in at a total consideration of $6,104,207, and the ore property at $8,550,607. There can be no doubt that these valuations were excessive.

The coal properties, with the price paid by the Steel Corporation for each principal parcel were as follows:

Sharon Coke Company: 1,448 acres of coal land and about 300 acres of surface fronting on the Monongahela River west of Lecrone	$1,388,964.66
Republic Coal Company: Tract between Buffington and Brownsville, containing 3,222 acres of coal and 511 acres of surface land	2,880,000.00
River Coal Company: 1,524 acres of coal and 179 acres of surface land near the Monongahela River, above Brownsville	720,000.00
Total	4,988,964.66

The difference between the amount paid for these coal lands and the total consideration given on page 283 represented the value of coke ovens, equipment, etc.

If the surface holdings alone are taken at an average of $80 per acre, which appears to be sufficient, the value of the coal, per acre, in these three tracts would be, respectively, about $943, $881, and $463, or an average of $793 for the 6,194 acres contained in all. The river coal is spoken of as steam coal, but there was a possibility of coking it; the other is coking coal and probably the best which was obtainable at the time it was purchased by the Union and Sharon interests, but does not rank so high as that in the Connellsville basin proper.

The highest ascertained price for coking-coal land in this general territory up to that time was $500 per acre for 3,000 acres purchased by the Clairton Steel interests in November, 1902. The average price in this and two other fairly large purchases about this time was almost exactly $560 per acre, or $233 per acre less than the average price paid by the Steel Corporation for the three parcels above described. As these latter comprised, altogether, practically 6,200 acres, the excess paid by the Steel Corporation over the average price paid in the three other transactions mentioned amounted, in round numbers, to $1,450,000. This amount may be considered as indicating, in a rough way, the excessive valuation placed on these properties in this transaction, since the other purchases above noted were made at just about the same time. This amount, however, would not represent the entire profit of the Union-Sharon interests on this coal property, since they probably acquired most of it at much less than $560 per acre.

The total consideration of $8,550,607 for the ore property was allotted as follows:

Sharon mine and equipment	$4, 400, 040
Property of Donora Mining Company	4, 150, 567
Total	8, 550, 607

There can be little doubt that these valuations were very liberal. Allowing $550,607 to cover improvements and equipment—which amount probably is about correct—it may be considered that the ore itself (subject, in the case of some of the mines of the Donora Mining Company, to a royalty) cost $4,000,000 for each parcel. In the annual report of the Steel Corporation for 1902 the total tonnage of ore covered by this purchase was given at approximately 40,000,000 tons. This (see p. 214) agreed substantially with estimates current in the trade which placed the tonnage of the Sharon mine at 21,000,000 tons, and that of the Donora mining properties at about 20,000,000 tons. The Sharon mine was purchased in fee. On an estimate of, say, 20,000,000 tons for this mine the cost of the ore would have been 20 cents a ton.[1] Such a price, in cash, for a fee, was far greater than the average of fee prices for such properties. As already shown on page 208, a committee of mining interests stated in a brief to the Minnesota legislature as late as 1908 that the highest price which they had known to have been paid for ore in fee was 15 cents a ton.

If all of the estimated tonnage of the Donora Mining Company properties (20,000,000 tons) had been owned in fee, the price paid for these would have been almost exactly the same per ton as in the case of the Sharon mine. Two important mines of the Donora Mining Company, however, were leaseholds, and the equity of the lessee in such ore holdings was worth much less than the interest of the owner of the fee. This gives added force to the other indications of overvaluation.

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[1] The slight difference between these averages and those given on page 214 is due to the fact that the former included improvements.

It will be recalled that the official announcement issued by the Steel Corporation stated that while the manufacturing properties had been taken over at their actual cost, the ore properties, coal lands, and real estate had been taken over at above the cost, but, it was claimed, at not more than the current market value. The price paid for these properties was very greatly in excess of the original cost to the Union Steel interests. Thus, the Sharon mine, for which the Steel Corporation paid approximately $4,000,000, exclusive of improvements, originally cost the Sharon Steel Company, according to reliable trade reports, only $150,000. Undoubtedly, at the time of its transfer to the Steel Corporation it was worth a very much greater sum, since the amount of ore in the mine proved to be very much larger than that originally estimated. The original cost of the properties of the Donora Mining Company is not definitely known, but it was undoubtedly but a small fraction of the price which was later paid by the Steel Corporation.

There can be no question that the prices paid by the Steel Corporation for both the coal and the iron-ore properties were considerably in excess of a fair valuation at the time of the transfer. The real significance of the transaction seems to be that the Steel Corporation desired to eliminate the competition of certain influential interests back of the Union concern, particularly that of Mr. Frick, and that the amount necessary to induce these owners to retire from such competition was, in effect, charged against the ore and coal. Nevertheless, the amount of this overvaluation, when compared with the enormous value of the assets of the Steel Corporation as a whole is not important, and the Bureau has entered these properties in its computation at the actual cost to the Corporation.

Clairton Steel purchase.—The properties acquired through the purchase of the Clairton Steel Company have already been described in Chapter V. (See pp. 254–255.) The terms of this purchase were given in the annual report of the Steel Corporation for 1904, where it was stated that the Corporation paid to the vendors $1,000,000, par value, in the Corporation's 10–60 year 5 per cent bonds, which had been acquired by it for this purpose in the open market at $813,850, and that in addition the Corporation guaranteed the outstanding bonded indebtedness of the Clairton concern to the extent of $10,230,000, as follows:

Clairton Steel Company 5 per cent mortgage bonds	$5,000,000
St. Clair Furnace Company first-mortgage bonds	2,980,000
St. Clair Steel Company first-mortgage bonds	2,250,000
Total	10,230,000

In addition to these there were outstanding against the properties of the Clairton Steel Company and its subsidiary companies the following bonds and mortgages:

St. Clair Terminal Railroad Company first-mortgage bonds	$1,000,000
Real-estate mortgages	1,666,715
Total	2,666,715

While these latter bonds and mortgages were not guaranteed by the Steel Corporation, they were a lien against important parts of the property acquired by it, and therefore they practically represented an addition to the cost of the acquisition.

In addition to the fixed property, the Corporation acquired with the plants working assets at par to the amount of $2,951,005, making the indicated cost of the fixed properties $10,759,560, as follows:

Steel Corporation 5 per cent bonds ($1,000,000) at cost	$813,850
Bonds of the Clairton Steel Company, St. Clair Furnace Company, St. Clair Steel Company, guaranteed	10,230,000
St. Clair Terminal Railroad Company bonds and real-estate mortgages, not guaranteed	2,666,715
Total	13,710,565
Net working assets	2,951,005
Cost of fixed properties to Steel Corporation	10,759,560

This total cost of the fixed property was distributed by the Corporation as follows:

Manufacturing	$6,915,196.94
Iron ore	1,176,797.81
Coal and coke	1,365,557.95
Transportation	1,093,163.61
Miscellaneous (limestone and town site)	208,844.11
Total cost of fixed property	10,759,560.42

The Bureau has accepted this cost as representing an equivalent addition to the investment of the Steel Corporation. The plants of the Clairton concern had a capacity of about 475,000 tons of pig iron annually and about 400,000 tons of steel. The company had extensive ore properties, over 2,600 acres of desirable coking-coal land, and considerable terminal railroad property. These facts and the further fact that the company was in the hands of receivers at the time of its acquisition suggest that the price paid was not unreasonable. As in the case of the Union properties, the price was in the form of bonds.[1]

TOTAL COST OF FIXED PROPERTY OF UNION AND CLAIRTON COMPANIES.—In the following table the cost of the fixed properties of the Union Steel Company and the Clairton Steel Company are combined. The current assets are not included in this table, for the reason that they have already been included in Table 32, since such total current assets were arrived at by comparing the balance sheets of the Steel Corporation from year to year.

TABLE 33.—COST OF FIXED PROPERTIES OF UNION AND CLAIRTON STEEL COMPANIES TO THE STEEL CORPORATION.

Description.	Union Steel Co.[1]	Clairton Steel Co.	Total.
Manufacturing	$14,335,838	$6,915,197	$21,251,035
Ore	8,467,776	1,176,798	9,644,574
Coal and coke	6,104,207	1,365,558	7,469,765
Transportation	1,004,462	1,093,163	2,097,625
Miscellaneous	368,349	208,844	577,193
Total	30,280,632	10,759,560	41,040,192

[1] The cost of the Union Steel Company property here given excludes an item of $579,869 for a minority interest in a subsidiary concern, that interest not having been acquired until 1903 and being included in the capital expenditures of that year given in Table 32, page 280. This explains the difference between the amounts here given for the manufacturing properties and the ore and those stated on page 283.

PURCHASE OF TROY STEEL PRODUCTS COMPANY AND OTHER SMALL CONCERNS.—Reference has already been made in Chapter V to the acquisition by the Steel Corporation of the Troy Steel Products Company and the Trenton Iron Company. These acquisitions have been taken account of on the books of the Steel Corporation through the additions to fixed property given in Table 32. Since these purchases

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[1] It may be noted that the actual investment made in these Clairton properties by the original owners at the time of the transfer, as computed by the Steel Corporation, was $17,663,287.09, distributed as follows:

Manufacturing plant	$10,294,774.06
Railroad	1,093,163.61
Coal	1,365,557.95
Iron ore	1,749,942.47
Limestone (credit)	*1,891.41*
Town site	210,735.52
Total	14,712,282.20
Net working assets	2,951,004.89
Grand total	17,663,287.09

While this apparently expresses the actual investment in the Clairton properties by the former owners (this amount including additions made only by incurring certain indebtedness, which, however, was assumed by those interests), the Bureau has deemed it proper to consider the value of the investment at the time of transfer as fully represented by the cost to the Steel Corporation.

were made on a cash basis and since they were relatively unimportant, they do not call for detailed analysis or criticism, and both the total cost and the distribution as made by the Steel Corporation have been accepted by the Bureau.

It is worth while, however, to make passing reference to certain circumstances connected with the acquisition of the Troy Steel Products Company, noted on page 256. The price paid for this concern was $1,100,000. The company had been unsuccessful, and, in fact, had been sold under reorganization in August, 1895. John D. Rockefeller and H. H. Rogers, both of whom were at that time directors in the United States Steel Corporation, were interested in the Troy Steel Products Company. It is impossible to say whether their connection with the two concerns had any influence upon the purchase or on the price paid, but it is proper to repeat that the plant had been idle for several years prior to this transfer, and that it was never operated by the Steel Corporation. It should be stated, however, that the stockholders of the Steel Corporation were specifically advised of the connection of these directors with the Troy concern in a notice of a meeting at which this transaction was submitted to them, and that they approved the purchase.

The acquisition of the Trenton Iron Company was such a small matter that it need not be discussed in detail.

Cost of Tennessee Coal, Iron and Railroad Company's plants.—As previously stated, the Steel Corporation in its reports has not distributed the cost of the Tennessee Coal, Iron and Railroad Company by the principal classes of property. Furthermore, in the official estimate of the value of the different kinds of property by the Steel Corporation as of January 1, 1908, given on page 314, the property of this concern is not distributed. No apportionment of this price, therefore, need be made in this discussion. At the moment it may simply be repeated, as shown in Chapter V, that the total cost of the Tennessee Coal, Iron and Railroad Company's fixed property at the date of acquisition on November 1, 1907, as entered in the Steel Corporation's balance sheet of December 31, 1907, was $48,961,208.83. There was expended during the months of November and December, 1907, on construction work on the Tennessee company's properties, $984,886.74, thus making the total cost of the fixed property up to the close of December, 1907, as carried on the Steel Corporation's balance sheet, $49,946,095.57.

The value of this Tennessee company's property has been the subject of much dispute. It has been argued, on the one hand, that the property was worth much less than it cost, and, on the other, that the Steel Corporation acquired this property at what was virtually a forced sale. The stated cost of the fixed property to the Steel

Corporation on November 1, 1907, of $48,961,208.83, was arrived at by the Corporation as follows:

TABLE 34. ANALYSIS OF COST OF FIXED PROPERTY OF TENNESSEE COAL, IRON AND RAILROAD COMPANY TO UNITED STATES STEEL CORPORATION AS OF NOVEMBER 1, 1907.

	Par value of T. C., I. and R. R. Co. common stock acquired.	10–60 bonds at par delivered in payment thereof.	Par value of bonds directly issued, and cost of bonds purchased, for delivery per preceding; also amount of cash payment made.
For full-paid common-stock certificates	$29, 109, 515. 00	$34, 654, 000. 00	$33, 949, 282. 48
For common stock subscription receipts, 20 per cent paid	632, 655. 00	753, 000. 00	735, 695. 16
Total paid for with bonds	29, 742, 170. 00	35, 407, 000. 00	34, 684, 977. 64
For 20 per cent installment paid Dec. 15, 1907, on subscription receipts	632, 655. 00		[1] 632, 655. 00
Total acquired and cost of the same	30, 374, 825. 00	35, 407, 000. 00	35, 317, 632. 64
Less, par of stock acquired			30, 374, 825. 00
Excess cost of stock over par as computed by Steel Corporation			4, 942, 807. 64
Fixed property investment per books of Tennessee Coal, Iron and Railroad as of Oct. 31, 1907, after adjustments and write-offs of $1,181,084.84 by the Steel Corporation			44, 037, 139. 65
Total			48, 979, 947. 29
Less, balance of undivided surplus of Tennessee Coal, Iron and Railroad on Oct. 31, 1907, remaining after the adjustments made by the Steel Corporation			18, 738. 46
Total cost as per United States Steel Corporation's annual report, 1907			48, 961, 208. 83

[1] Cash.

In explanation of this table it may be noted that the total cost of $48,961,208.83 is the book cost of the Tennessee Coal, Iron and Railroad fixed properties, after certain adjustments made by the Steel Corporation, plus the excess ($4,942,807.64) paid for the stock of that company by the Steel Corporation over its par value. This cost applies only to fixed properties. The excess of $4,942,807.64 is arrived at by counting $30,000,000 of United States Steel bonds directly issued from the Corporation's treasury at their par value, but counting the remaining $5,407,000 delivered in part payment at the actual cost to the Steel Corporation in the open market, namely, $4,684,977.64; a small amount of cash ($632,655) was also paid as part of the total consideration. It should be understood, therefore, that the total cost of $35,317,632.64 for the Tennessee company's stock, as given in this table, is not a cash equivalent price, since the market value of the total bonds delivered in payment for the stock would have been considerably less than $35,317,632.64, the amount here entered, as these bonds at that time were selling at only about 86 per cent of their par value. In fact, at the market value of the bonds issued, the total consideration was almost exactly equal to the par value of the Tennessee company's stock purchased.

The valuation of the fixed property, as per the books of the Tennessee Coal, Iron and Railroad Company, after the adjustments made by the Steel Corporation, was made up as follows:

Plants and equipment	$15,382,233.71
Real estate	26,525,143.93
Birmingham Southern Railroad	1,442,698.11
Land and town-site companies	289,063.90
Potter Ore Company	398,000.00
Total	[1] 44,037,139.65

This book valuation of $15,382,234 for the plants, which does not include the sites, seems rather liberal, and likewise that of $26,525,144 for the real estate, which also covers the extensive mineral lands of the company (except for the Potter Ore Company), seems high. It is true that the mineral resources of the company were enormous, both with respect to ore and coal. However, the vast amount of such resources in this region and the somewhat restricted market demand therefor resulted in a very low market value for them, and it is a very fair question whether these mineral properties and detached real estate of the Tennessee company could have been readily sold for cash for $26,500,000.

The price paid for the stock, as above given, namely, $35,317,633 (chiefly in bonds), indicates an average price of $116 per share. The book value of this stock, as indicated by the balance sheet of October 31, 1907, before the adjustments made by the Steel Corporation, was 104 per cent of its par value. The stock had sold on the New York Stock Exchange for some years at very considerably above these figures. For the two years prior to its sale to the Steel Corporation the average price was about $146 per share. The stock was, however, a very speculative security, so that the market quotations are not a very satisfactory guide. Moreover, the price of the stock would, of course, be influenced by intangible considerations which are not taken account of by the Bureau. Nevertheless, it is fair to consider these market quotations in connection with the discussion of the tangible assets. It appears also that certain of the chief holders of this stock who made the arrangements for exchanging it for Steel Corporation bonds stipulated that all the holders of this stock should have the privilege of exchanging on the same terms; and it also appears that practically all holders of this stock availed themselves of these terms, although some, at least, were under no financial necessity of doing so. It should be kept in mind that the Steel Corporation, by this acquisition, eliminated a competitor of growing importance, and that the price paid may have been swelled on this account.

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[1] It should be observed that this is not the cost to the Steel Corporation.

Taking all the evidence together, it seems probable that while the price paid may have somewhat exceeded a fair valuation of the property the discrepancy would not be of sufficient importance to call for a detailed analysis.

Section 4. Total gross additions to the investment of the Steel Corporation, 1901–1910.

The original cost of the fixed properties of the three concerns above discussed and of the additions made directly, as per Table 32, page 280, are summarized below.

TABLE 35.—TOTAL GROSS ADDITIONS TO PROPERTY OF THE STEEL CORPORATION APRIL 1, 1901, TO DECEMBER 31, 1910.

Class of property.	Additions directly made, as per Table 32 (p. 280).	Cost of Union and Clairton companies, as per Table 33 (p. 288).	Total before allowing for depreciation.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):			
Manufacturing	$130,229,414	$21,251,035	$151,480,449
Iron ore	52,449,357	9,644,574	62,093,931
Coal and coke	26,642,538	7,469,765	34,112,303
Transportation	72,443,404	2,097,625	74,541,029
Miscellaneous fixed property	4,971,363	577,193	5,548,556
Other assets:			
Deferred charges	13,243,678	....	13,243,678
Investments	2,128,364	....	2,128,364
Sinking funds	16,067,666	....	16,067,666
Net current assets	101,683,544	....	101,683,544
Total	419,859,328	41,040,192	460,899,520
Gary plant [1]	69,978,695	....	69,978,695
Tennessee Coal, Iron and Railroad Company [2]	60,468,518	....	60,468,518
Sundry adjustments [3]	3,063,594	....	3,063,594
Grand total	553,370,135	41,040,192	594,410,327

[1] Includes city of Gary and railroad property. This is the book cost.

[2] Original cost to Steel Corporation of fixed property plus subsequent additions.

[3] Sundry adjustments not distributed by classes of property.

Section 5. Depreciation allowances of the Steel Corporation.

As already made clear, the additions to the fixed property of the Steel Corporation above given are gross; that is, they do not allow for depreciation (including exhaustion and obsolescence). In order to arrive at the net investment at any given time, therefore, it is necessary to consider this question of depreciation. This is a matter of considerable importance and one which is not readily intelligible from the annual reports.

The Steel Corporation has written off very large amounts from the book value of its fixed property. Thus, whereas the total capital expenditures on its fixed property down to the close of 1910 (exclusive of the original cost of the Union, Clairton, and Tennessee Coal, Iron and Railroad purchases) was $371,285,674, the company wrote off from such property no less than $329,892,199, or nearly 90 per cent of the additions.

These large amounts thus written off, however, do not represent exclusively true depreciation of the physical properties of the Steel Corporation. Instead, a large part of these amounts really represent arbitrary deductions intended to offset the inflated valuations at which the property is carried on the Steel Corporation's books. (See p. 295.)

In fact, the Corporation itself has stated that the amounts written off its property account on the balance sheet afford no real indication of the actual depreciation of its physical properties. The Bureau, therefore, made a careful study of this question of depreciation with officials of the Corporation.

GENERAL PRINCIPLE ON WHICH DEPRECIATION IS COMPUTED.—Before discussing the problem in detail it is desirable to make clear the general principle which governs the depreciation charges of the Steel Corporation and its subsidiary concerns.

In the first place, the depreciation and exhaustion charges proper are based upon the original investment in the physical properties by the constituent concerns, and not upon their replacement cost. This is a fundamentally correct method. In the second place, a distinction is made between true depreciation as computed by the subsidiary companies on their book investment in the various physical properties and the so-called depreciation written off by the Corporation itself from its own books because of the higher values assigned some of these properties on such books to offset its own inflated capitalization. For example, suppose a subsidiary company was capitalized at $25,000,000 but that the Steel Corporation had issued its stock for this subsidiary company to the amount of $50,000,000. Under these circumstances the property account of the subsidiary company would have to be increased on the books of the Steel Corporation in order to balance the larger amount of securities issued by the latter. The subsidiary company would arrive at its depreciation provisions on the basis of its investment figure at $25,000,000. However, these provisions would be an entirely inadequate allowance for the Steel Corporation in respect to this particular property because of the higher valuation at which it carried the same property. Therefore, the Steel Corporation must and does write off from its books further sums in addition to those provided by the subsidiaries; otherwise it would not be conserving its own capital (or what it considers to be its own capital).

These further sums, however, assuming that the provisions of the subsidiary companies were properly arrived at, do not represent true depreciation or exhaustion of physical property, but, instead, are simply bookkeeping provisions necessary to maintain the nominal investment of the Steel Corporation intact. In other words, they amount to writing down water in the Steel Corporation's capitalization. While this procedure is eminently proper, and in fact desirable from the Steel Corporation's standpoint, accepting its organization on the basis actually followed, these further sums should be disregarded in the Bureau's calculation, which is expressly aimed to establish an investment which would exclude the water as well as intangible considerations. A part of these further provisions is in the form of sinking funds of the Steel Corporation's own bonds, but a considerable part is written off the property account from surplus.

So far as the amounts written off for bond sinking funds are concerned, it is apparent that these have no necessary correspondence to depreciation requirements, since they are usually governed by the terms of the indentures and can be considered as representing depreciation only on the ground that the amounts otherwise provided are not sufficient. The Steel Corporation's sinking-fund provisions are admittedly not necessary to provide for depreciation in the value of the physical property. The sinking-fund provisions of some of the subsidiary companies, however, may for convenience be treated as the equivalent of depreciation, although not necessarily such in principle.

The book value of the various properties in the Steel Corporation's accounts is not itemized in such a way as to show the valuations assigned particular properties or classes of property; therefore, the property account of the Steel Corporation can not be compared in detail with the property accounts of the several constituent concerns. However, practically the entire excessive or increased valuation of the property as entered on the Steel Corporation's books to balance its capitalization may be regarded as applicable to natural resources, particularly ore and coal. This is, indeed, admitted by the Steel Corporation itself. Moreover, this is indicated by the valuations of the various properties as shown in the Hodge suit, and also in the Corporation's 1907 appraisal, discussed subsequently. That is to say, the properties other than natural resources are carried on the Steel Corporation's books at approximately correct valuations and, therefore, the depreciation provisions of the subsidiary companies for these classes of property do not have to be increased by the Steel Corporation itself, but, in the case of the natural resources, the Steel Corporation must, because of the inflated valuations at which it carries these properties, write off further so-called depreciation allowances in addition to those made by the subsidiary concerns. Following is a statement by an official of the Steel Corporation on this point:

> The several subsidiary companies have, except as to iron ore and fuel, been charging out depreciation in their own accounts on basis of the values placed upon all of the various classes of property as listed in the Corporation's appraisal of January 1, 1908. These valuations are in all cases the original construction cost (estimated if actual not known) of the improvements or other property subject to depreciation. In respect of iron ore and fuel, the subsidiaries have charged depreciation on basis only of their own respective investments in those properties.
>
> On the foregoing basis, therefore, the subsidiary companies have been charging sufficient depreciation to cover the exhaustion transpiring in the capital investment as represented in the Steel Corporation's appraisal of 1908, except as to the two classes of property named, viz, iron ore and fuel. Now, this difference, i. e., the difference between the depreciation charged out by the subsidiaries, and the pro rata depreciation which should be charged out on basis of the investment as represented by the par of Steel Corporation stock and bonds, is covered by the charge for bond sinking fund on United States Steel Corporation bonds made by the latter company in its own accounts. As the depreciation charges made by the subsidiaries are based upon investment valuations for all properties as represented in Steel Corporation's appraisal, except as to ore and fuel, it follows that the depreciation allowances made by United States Steel Corporation proper in its own accounts through bond sinking fund charges, must cover the depreciation taking place, through exhaustion, in the appreciated values for ore and fuel as represented by the difference between the investment in those classes of property per the books of the subsidiary companies and the value thereof as represented in United States Steel Corporation securities.

Since, however, as just stated, the Bureau is considering the actual investment and not the inflated investment shown on the books of the Steel Corporation, no further attention need be paid to these so-called additional depreciation provisions made by the Steel Corporation itself, which, as just stated, are practically equivalent to writing down the water in its capitalization. The provisions made by the subsidiary companies themselves may now be taken up. In doing this it will be convenient to discuss briefly the provisions for the maintenance and improvement of the Corporation's properties as a whole. These provisions fall under four general classes—(1) ordinary maintenance and repairs; (2) extraordinary replacements; (3) depreciation and exhaustion allowances; (4) new construction and capital expenditures.

ORDINARY MAINTENANCE AND REPAIRS.—The expenditures for ordinary maintenance and repairs were defined by the Corporation as follows:

> Charges to "repairs" comprehend expenditures incurred in keeping in repair all operating machinery and equipment; also

> cost of replacing broken and worn-out parts. In the case of a billet mill, it would include repairs to heating furnaces, soaking pits, charging and drawing cranes and machinery; engines, roll trains and roll tables, ingot buggies, shears, shear tables, mill cranes, and hydraulic machinery; motors and electrical machinery; scales, scrap conveyers, etc.; in short, all cost of repairing and maintaining the so-called "active" portion of the manufacturing equipment.
>
> Charges to "maintenance," on the other hand, are restricted to the parts of a mill which are less directly involved in the product of a mill, or at least are not influenced to the same extent by the output. Maintenance charges might be high in a month when but little product is made. The account includes cost of repairing and maintaining mill buildings and roofs, trestles, tracks, track scales, fences, sidewalks, cleaning and keeping yards and roadways; repairs and maintenance of sewers and gas mains, subways and viaducts. It also includes all cost of appliances for fire protection and the cost of operating these. There is also this difference between the "repair" and "maintenance" account, namely, that the latter includes charges in the nature of maintaining yards, fences, roadways, buildings, etc., which are general to the entire plant, while "repairs" are always specific; in fact, for short, we frequently distinguish the one as "product repairs" and the other as "general repairs."

From this statement it would appear that the ordinary maintenance and repair expenditures alone go far toward maintaining the property in a state of efficiency. This is, moreover, indicated by the size of these expenditures, which for the ten-year period aggregate, roughly, $259,000,000 (1901 figures being estimated, at $14,000,000, because exact data have never been compiled), as follows:

TABLE 36.—ANNUAL EXPENDITURES OF UNITED STATES STEEL CORPORATION FOR ORDINARY MAINTENANCE AND REPAIRS, BY CLASSES OF PROPERTY, 1901–1910.

Year.	Manufacturing properties.	Iron-ore properties.	Coal and coke properties.	Railroads.	Steamships and docks.	Miscellaneous fixed properties.	Total all properties.
1901	....	....	....	....	....	....	[1] $14,000,000.00
1902	$16,099,217.94	$355,220.12	$881,804.77	$3,544,654.27	$313,801.37	$35,519.66	21,230,218.13
1903	16,046,275.00	299,204.79	967,705.49	3,989,669.49	389,368.61	153,190.00	21,845,413.38
1904	12,857,738.82	209,475.11	983,389.61	3,679,735.90	291,103.24	134,055.75	18,155,498.43
1905	16,661,943.49	274,443.75	1,472,450.57	4,898,956.24	532,412.13	136,423.20	23,976,629.38
1906	20,648,213.19	292,086.71	1,453,759.13	6,137,244.71	640,063.34	145,543.36	29,316,910.44
1907	23,256,791.26	438,110.56	1,527,545.74	7,863,446.76	740,458.53	195,340.39	34,021,693.24
1908	15,991,141.20	572,405.87	1,740,563.61	6,049,275.69	628,927.20	168,851.13	25,151,164.70
1909	21,504,281.07	716,816.92	2,238,858.40	7,591,806.24	533,221.36	216,490.87	32,801,474.86
1910	25,147,444.00	896,723.29	2,408,665.74	9,337,563.23	690,526.07	291,957.89	38,772,880.22
1901–1910	168,213,045.97	4,054,487.12	13,674,743.06	53,092,352.53	4,759,881.85	1,477,372.25	259,271,882.78
1901–1907	105,570,179.70	1,868,541.04	7,286,655.31	30,113,707.37	2,907,207.22	800,072.36	162,546,363.00

[1] Figures for 1901 have never been compiled, but have been estimated at $14,000,000 for all classes of property.

The expenditures for ordinary maintenance and repairs on the Tennessee Coal, Iron and Railroad properties during the three years 1908–1910, which are included in the above, were as follows:

Manufacturing	$3, 560, 984
Iron ore	825, 367
Coal and coke	1, 656, 935
Railroad	745, 881
Miscellaneous	74, 638
Total	6, 863, 805

Extraordinary replacements.—The nature of the extraordinary replacement and renewal funds is indicated by the following statement taken from the Corporation's annual report for 1904, regarding the funds maintained for such expenditures:

> These funds are used to improve, modernize, and strengthen the properties. They are not used for ordinary maintenance, repairs, and renewals (such expenses are included in current operating costs), but for the rehabilitation of departments and plants through entire rebuilding or rearrangement, the installation of labor-saving devices, and the substitution of improved and modern machinery, equipment, facilities, etc., for obsolete types, etc. They are designed to provide for the current depreciation and obsolescence which is constantly taking place in the physical condition of a property, but can not be definitely cared for by replacement or substitution from year to year.

The expenditures for extraordinary replacements are essentially depreciation charges. They are not, however, exclusively so, because in some instances a portion of the amount so expended represented net capital additions to the property. The expenditures for blast-furnace relining, which are charged directly into the cost of operation through a stated allowance per ton for every ton of pig iron produced, may also be considered in the nature of depreciation.

Depreciation and extinguishment fund.—A further part of the provisions for depreciation and exhaustion (more especially the latter) is made through what is known as the "depreciation and extinguishment fund." Certain amounts are set aside from the earnings to this fund each year. Such provisions are intended chiefly to represent the exhaustion of natural resources, like ore, coal, and natural gas. A very small part may represent depreciation of other property. The expenditures from this fund are not, however, necessarily applied to the replacement of such properties, but may be used for any purpose to which the Corporation sees fit to apply them.

Other depreciation provisions.—In addition to these provisions for extraordinary replacements, the Steel Corporation provides for a certain amount of depreciation through the bond sinking funds of subsidiary companies. While, as already stated, the retirement of bonded debt through sinking funds does not necessarily have any relation to the depreciation of property, for convenience it may be assumed that, in the absence of sufficient depreciation charges through other means, amounts so set aside for the redemption of bonds are equivalent to allowances for depreciation. This is the view taken by the Steel Corporation with respect to the sinking-fund operations of several of its subsidiary companies, and it has been accepted by the Bureau, in the main, so far as these companies are concerned, for the practical reason of convenience. It should be emphasized, however, that the Bureau is not indorsing the principle that the redemption of bonds through sinking funds affords any real measure of the true depreciation of the property.

The expenditures for ordinary maintenance and repairs are charged directly into the cost of production. This, as just stated, is also true of the provisions for blast-furnace relining. The provisions for extraordinary replacements and renewals likewise are charged by the Corporation to earnings and are not capitalized.[1]

The capital expenditures by the Corporation, which are designated as "construction expenditures," are over and above these other charges.

Section 6. Analysis of the depreciation allowances of the Corporation.

The total provisions for depreciation, exhaustion, and obsolescence made by the Steel Corporation's subsidiary companies during the period 1901–1910—this not including, for reasons already explained, the arbitrary amounts written off by the Steel Corporation itself, nor the provisions for sinking funds for the Corporation's own bonds—were $241,295,477 [2]; this includes blast-furnace relining provisions of $19,569,636. The great bulk of the total represents amounts set aside from earnings to the various funds above discussed, particularly the extraordinary replacement fund, the depreciation and extinguishment fund, and the bond sinking funds of subsidiary companies; in a few instances there were special provisions in addition to these.

The amounts thus provided by even the subsidiary companies themselves, however, exceeded in some cases the necessary allowance for depreciation and exhaustion of the physical properties. This is admitted by the Steel Corporation itself. In the aggregate, it was decided after discussion with the Corporation that substantially $38,285,000 of the amounts thus provisionally set aside was unnecessary. In order to arrive at a corrected or true total of the estimated physical depreciation, exhaustion, and obsolescence of the physical properties it is necessary therefore to deduct this excess from the total of $241,295,477 above given. This is done in the following table, which gives the total provisions from all sources for depreciation, exhaustion, and obsolescence by classes of property, and also the blast-furnace relining provisions and expenditures. In the second column are given those portions of the amounts thus provisionally set aside which have been designated as unnecessary and excessive. The third column (which represents the difference between the provisional amounts as stated in the first column and the excessive amounts given in the second column) shows, therefore, the approximate true depreciation and obsolescence of the various classes of property. The fourth column shows the amounts actually expended on these properties during this interval to make up such depreciation and exhaustion, and the fifth column shows the unrestored balance, which, therefore, represents what may be termed the "net accrued," or net outstanding, depreciation at the close of the ten-year period.

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[1] In one or two instances, certain amounts expended from the extraordinary replacement funds have been devoted to new construction. Such instances have been duly taken account of by the Bureau.

[2] The total does not include an item of $385,181 representing interest on various depreciation funds.

Table 37. REVISION OF DEPRECIATION AND OBSOLESCENCE CHARGES OF SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION, 1901–1910.

[These figures do not include certain provisions by the Steel Corporation itself for so-called depreciation, but which really are not depreciation. See text.]

	Total amount provided from all sources for depreciation and obsolescence.	Amounts excluded as excessive.	Estimated true depreciation.	Amount made good by expenditures not capitalized.	Net outstanding depreciation. (See Table 38.[1])
A. PROPERTIES OTHER THAN THOSE OF THE TENNESSEE COAL, IRON AND RAILROAD COMPANY.					
Manufacturing properties:					
1901 (9 months)	$4,025,950	[2] *$1,500,000*	$5,525,950	$3,354,107	$2,171,843
1902	15,215,425	7,000,000	8,215,425	5,730,370	2,485,055
1903	7,320,581	[2] *850,000*	8,170,581	7,816,197	354,384
1904	5,871,255	[2] *900,000*	6,771,255	5,289,082	1,482,173
1905	8,725,657	....	8,725,657	7,372,244	1,353,413
1906	16,066,067	6,000,000	10,066,067	11,916,165	[3] *1,850,098*
1907	14,171,770	3,850,000	10,321,770	14,844,162	[3] *4,522,392*
1908	8,426,136	700,000	7,726,136	8,169,048	[3] *442,912*
1909	12,485,593	690,000	11,795,593	4,988,293	6,807,300
1910	12,697,193	590,000	12,107,193	4,819,576	7,287,617
Total	105,005,627	15,580,000	89,425,627	74,299,244	15,126,383

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[1] These amounts do not necessarily represent an actual net loss in the values of the plants as indicated by their operating efficiency. They are presumed to cover both the loss in value which may have accrued from that source, plus an allowance for obsolescence.

[2] Amount added to cover estimated deficiency for each year in original provisions.

[3] Net additions not capitalized over and above true depreciation.

TABLE 37.—REVISION OF DEPRECIATION AND OBSOLESCENCE CHARGES OF SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION, 1901–1910—Continued.

	Total amount provided from all sources for depreciation and obsolescence.	Amounts excluded as excessive.	Estimated true depreciation.	Amount made good by expenditures not capitalized.	Net outstanding depreciation. (See Table 38.[1])
A. PROPERTIES OTHER THAN THOSE OF THE TENNESSEE COAL, IRON AND RAILROAD COMPANY—con.					
Manufacturing properties—Con.					
Blast-furnace relining—					
1901 (9 months)	$800,000	[2] *$120,000*	$920,000	$743,000	$177,000
1902	1,247,363	[2] *180,000*	1,427,363	1,245,583	181,780
1903	3,439,471	2,000,000	1,439,471	2,672,058	[3] *1,232,587*
1904	1,270,959	[2] *200,000*	1,470,959	1,413,022	57,937
1905	2,016,744	....	2,016,744	801,902	1,214,842
1906	2,345,586	....	2,345,586	1,177,017	1,168,569
1907	2,267,212	....	2,267,212	1,480,310	786,902
1908	1,347,525	....	1,347,525	2,127,910	[3] *780,385*
1909	2,314,331	....	2,314,331	1,028,108	1,286,223
1910	2,085,235	....	2,085,235	1,930,355	154,880
Total relining	19,134,426	1,500,000	17,634,426	14,619,265	3,015,161
Total manufacturing	124,140,053	17,080,000	107,060,053	88,918,509	18,141,544
Iron-ore and timber properties:					
1901 (9 months)	1,524,236	....	1,524,236	....	1,524,236
1902	3,117,296	600,000	2,517,296	....	2,517,296
1903	2,669,994	....	2,669,994	212,020	2,457,974
1904	1,938,914	....	1,938,914	152,828	1,786,086
1905	3,271,256	....	3,271,256	316,402	2,954,854
1906	3,410,383	....	3,410,383	312,038	3,098,345
1907	4,750,147	....	4,750,147	428,142	4,322,005
1908	2,790,113	....	2,790,113	379,820	2,410,293
1909	3,729,714	....	3,729,714	216,820	3,512,894
1910	3,691,444	....	3,691,444	326,946	3,364,498
Total	30,893,497	600,000	30,293,497	2,345,016	27,948,481
Coal and coke properties:					
1901 (9 months)	874,516	....	874,516	....	874,516
1902	1,865,592	200,000	1,665,592	96,941	1,568,651
1903	1,515,451	[2] *50,000*	1,565,451	194,132	1,371,319
1904	2,120,942	100,000	2,020,942	676,085	1,344,857
1905	3,418,181	800,000	2,618,181	1,304,679	1,313,502
1906	3,138,998	300,000	2,838,998	1,171,422	1,667,576
1907	2,914,052	250,000	2,664,052	773,550	1,890,502
1908	1,712,785	....	1,712,785	593,629	1,119,156
1909	2,682,180	....	2,682,180	385,115	2,297,065
1910	2,578,289	....	2,578,289	339,112	2,239,177
Total	22,820,986	1,600,000	21,220,986	5,534,665	15,686,321

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[1] These amounts do not necessarily represent an actual net loss in the values of the plants as indicated by their operating efficiency. They are presumed to cover both the loss in value which may have accrued from that source, plus an allowance for obsolescence.

[2] Amount added to cover estimated deficiency for each year in original provisions.

[3] Net additions not capitalized over and above true depreciation.

TABLE 37.—REVISION OF DEPRECIATION AND OBSOLESCENCE CHARGES OF SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION, 1901–1910—Continued.

	Total amount provided from all sources for depreciation and obsolescence.	Amounts excluded as excessive.	Estimated true depreciation.	Amount made good by expenditures not capitalized.	Net outstanding depreciation. (See Table 38.[1])
A. PROPERTIES OTHER THAN THOSE OF THE TENNESSEE COAL, IRON AND RAILROAD COMPANY—con.					
Railroads:					
1901 (9 months)	$2,031,257	$100,000	$1,931,257	$96,603	$1,834,654
1902	2,206,246	347,272	1,858,974	360,695	1,498,279
1903	2,466,873	677,792	1,789,081	972,169	816,912
1904	2,402,210	453,835	1,948,375	76,119	1,872,256
1905	4,904,126	2,460,088	2,444,038	1,854,027	590,011
1906	4,655,510	1,791,388	2,864,122	707,321	2,156,801
1907	5,654,881	2,436,572	3,218,309	1,658,082	1,560,227
1908	3,894,288	1,088,543	2,805,745	81,951	2,723,794
1909	4,337,802	1,266,460	3,071,342	969,821	2,101,521
1910	5,421,371	716,348	4,705,023	886,789	3,818,234
Total	37,974,564	[2] 11,338,298	26,636,266	7,663,577	[3] 18,972,689
Steamships:					
1901 (9 months)	451,161	[4] *175,000*	626,161	76,756	549,405
1902	919,976	175,000	744,976	192,318	552,658
1903	574,687	....	574,687	481,672	93,015
1904	749,901	....	749,901	197,982	551,919
1905	1,907,567	....	1,907,567	784,044	1,123,523
1906	1,069,720	....	1,069,720	1,631,510	[5] *561,790*
1907	830,562	....	830,562	190,565	639,997
1908	743,401	....	743,401	299,038	444,363
1909	1,364,584	....	1,364,584	554,619	809,965
1910	1,085,789	....	1,085,789	706,619	379,170
Total	[6] 9,697,348	....	9,697,348	5,115,123	4,582,225
Miscellaneous fixed properties:[7]					
1901 (9 months)	74,248	[4] *70,000*	144,248	....	144,248
1902	386,186	[4] *80,000*	466,186	53,612	412,574
1903	338,882	[4] *90,000*	428,882	13,738	415,144
1904	482,525	[4] *85,000*	567,525	35,587	531,938
1905	974,440	220,000	754,440	228,764	525,676
1906	1,168,799	125,000	1,043,799	892,048	151,751

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[1] These amounts do not necessarily represent an actual net loss in the values of the plants as indicated by their operating efficiency. They are presumed to cover both the loss in value which may have accrued from that source, plus an allowance for obsolescence.

[2] Of this total of $11,338,298 the sum of $4,148,955 is the estimated excess allowance for amortization of investment account Duluth, Missabe & Northern, Duluth & Iron Range Railroad, and St. Clair Terminal Railroad Co.; the balance represents allowances made for additions and betterments.

[3] This balance of $18,972,689 includes $6,712,612 of allowances for amortization account investment in Duluth, Missabe & Northern and Duluth & Iron Range Railroad; the corporation contends that no actual diminution of property values to this extent has thus far taken place.

[4] Amount added to cover estimated deficiency for each year in original provisions.

[5] Net additions not capitalized over and above true depreciation.

[6] This total includes $1,844,414 of credits for receipts from sale of boats and allowances for values of boats lost.

[7] Includes miscellaneous docks; in Table 38 such docks are included under transportation.

TABLE 37.—REVISION OF DEPRECIATION AND OBSOLESCENCE CHARGES OF SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION, 1901–1910—Continued.

	Total amount provided from all sources for depreciation and obsolescence.	Amounts excluded as excessive.	Estimated true depreciation.	Amount made good by expenditures not capitalized.	Net outstanding depreciation. (See Table 38.[1])
A. PROPERTIES OTHER THAN THOSE OF THE TENNESSEE COAL, IRON AND RAILROAD COMPANY—con.					
Miscellaneous fixed properties—Continued.					
1907	$934,291	$80,000	$854,291	$555,877	$298,414
1908	180,892	[2] *100,000*	280,892	57,620	223,272
1909	344,821	25,000	319,821	88,072	231,749
1910	360,883	[2] *25,000*	385,883	193,395	192,488
Total	5,245,967	....	5,245,967	2,118,713	3,127,254
Summary, exclusive of Tennessee Coal, Iron and Railroad properties.					
Manufacturing properties	105,005,627	15,580,000	89,425,627	74,299,244	15,126,383
Blast-furnace relining	19,134,426	1,500,000	17,634,426	14,619,265	3,015,161
Total manufacturing	124,140,053	17,080,000	107,060,053	88,918,509	18,141,544
Iron ore and timber properties	30,893,497	600,000	30,293,497	2,345,016	27,948,481
Coal and coke properties	22,820,986	1,600,000	21,220,986	5,534,665	15,686,321
Railroads	37,974,564	[3] 11,338,298	26,636,266	7,663,577	[4] 18,972,689
Steamships	[5] 9,697,348	....	9,697,348	5,115,123	4,582,225
Miscellaneous fixed properties	5,245,967	....	5,245,967	2,118,713	3,127,254
Special allowance in 1903 used to cover construction	7,667,059	7,667,059	....	....	....
Grand total	238,439,474	38,285,357	200,154,117	111,695,603	88,458,514
B. TENNESSEE COAL, IRON AND RAILROAD COMPANY.					
Manufacturing properties:					
1907 (2 months, November and December)	47,995	....	47,995	32,174	15,821
1908	232,688	....	232,688	348,077	[6] *115,389*
1909	360,263	....	360,263	411,382	[6] *51,119*
1910	490,126	....	490,126	261,372	228,754
Total	1,131,072	....	1,131,072	1,053,005	78,067

[1] These amounts do not necessarily represent an actual net loss in the values of the plants as indicated by their operating efficiency. They are presumed to cover both the loss in value which may have accrued from that source, plus an allowance for obsolescence.

[2] Amount added to cover estimated deficiency for each year in original provisions.

[3] Of this total of $11,338,298 the sum of $4,148,955 is the estimated excess allowance for amortization of investment account Duluth, Missabe & Northern, Duluth & Iron Range Railroad, and St. Clair Terminal Railroad Co.; the balance represents allowances made for additions and betterments.

[4] This balance of $18,972,689 includes $6,712,612 of allowances for amortization account investment in Duluth, Missabe & Northern and Duluth & Iron Range Railroad; the corporation contends that no actual diminution of property values to this extent has thus far taken place.

[5] This total includes $1,844,414 of credits for receipts from sale of boats and allowances for values of boats lost.

[6] Net additions not capitalized over and above true depreciation.

TABLE 37.—REVISION OF DEPRECIATION AND OBSOLESCENCE CHARGES OF SUBSIDIARY COMPANIES OF THE UNITED STATES STEEL CORPORATION, 1901–1910—Continued.

	Total amount provided from all sources for depreciation and obsolescence.	Amounts excluded as excessive.	Estimated true depreciation.	Amount made good by expenditures not capitalized.	Net outstanding depreciation. (See Table 38.[1])
B. TENNESSEE COAL, IRON AND RAILROAD COMPANY—con.					
Manufacturing properties—Con.					
Blast-furnace relining—					
1907 (2 months, November and December)	$15,929	....	$15,929	$1,665	$14,264
1908	111,690	....	111,690	49,881	61,809
1909	139,289	....	139,289	172,807	[2] *33,518*
1910	168,302	....	168,302	115,664	52,638
Total	435,210	....	435,210	340,017	95,193
Total manufacturing	1,566,282	....	1,566,282	1,393,022	173,260
Iron ore:					
1907 (2 months, November and December)	13,039	....	13,039	4,583	8,456
1908	93,700	....	93,700	5,084	88,616
1909	109,493	....	109,493	10,443	99,050
1910	79,252	....	79,252	26,241	53,011
Total	295,484	....	295,484	46,351	249,133
Coal and coke:					
1907 (2 months, November and December)	44,030	....	44,030	6,051	37,979
1908	213,584	....	213,584	20,541	193,043
1909	236,192	....	236,192	123,027	113,165
1910	216,571	....	216,571	160,403	56,168
Total	710,377	....	710,377	310,022	400,355
Railroad:					
1907 (2 months, November and December)	25,143	....	25,143	375	24,768
1908	53,416	....	53,416	701	52,715
1909	79,673	....	79,673	71,132	8,541
1910	60,628	....	60,628	11,240	49,388
Total	218,860	....	218,860	83,448	135,412
Miscellaneous fixed properties:					
1907 (2 months, November and December)	2,512	....	2,512	....	2,512
1908	12,521	....	12,521	....	12,521
1909	16,508	....	16,508	....	16,508
1910	33,459	....	33,459	....	33,459
Total	65,000	....	65,000	....	65,000
Total Tennessee Coal, Iron and Railroad properties	2,856,003	....	2,856,003	1,832,843	1,023,160
Grand total, all properties, 1901–1910	[3] 241,295,477	$38,285,357	[3] 203,010,120	113,528,446	[3] 89,481,674

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[1] These amounts do not necessarily represent an actual net loss in the values of the plants as indicated by their operating efficiency. They are presumed to cover both the loss in value which may have accrued from that source, plus an allowance for obsolescence.

[2] Net additions not capitalized over and above true depreciation.

[3] Does not include an item of $385,181 (representing interest accumulations on sundry depreciation funds) which could not be distributed.

From this table, therefore, it will be seen that the estimated deterioration or exhaustion of the physical properties of the Steel Corporation during the entire period from April 1, 1901, to December 31, 1910, including an allowance for obsolescence, and also including blast-furnace relining, amounted to $203,000,000, this being the amount after excluding that portion of the provisional allowances which was regarded as unnecessary. Of this total a little over $113,500,000 had actually been made good by expenditures upon these various properties, leaving a balance of about $89,500,000, which may be termed the net accrued or net outstanding depreciation on December 31, 1910. This latter figure, it should be kept in mind, includes an allowance for obsolescence. This obsolescence is not always apparent in the physical condition of the property but must nevertheless be allowed for in order to avoid unduly large depreciation charges at some future period.

By deducting the amounts which represent the net accrued or net outstanding depreciation from the sum of the original investment plus subsequent capital expenditures, the total net investment in the fixed properties of the Steel Corporation at the end of 1910 may be established. It will be understood, of course, that in so far as the estimated depreciation or deterioration of the property is made good by actual expenditures thereon, to this extent the assumed reduction in the value of the property has been restored; therefore, to arrive at the actual condition of the property at the end of 1910, obviously there should not be deducted from the gross investment the full amount of the estimated depreciation, but simply the balance not made good, or, as it is here called, the net outstanding depreciation. (See p. 299.)

Before doing this, however, it is worth while to analyze the figures of adjusted or true depreciation given in the preceding table by classes of property, with a view to determining whether or not these amounts are reasonable and proper.

MANUFACTURING PROPERTIES.—The total estimated true depreciation of the manufacturing properties, including blast-furnace relining (but excluding the Tennessee Coal, Iron and Railroad Company), is $107,060,053, or an average of $10,980,518 per year for the entire period. The original investment in these manufacturing properties, as shown on page 188, has been placed at $250,000,000, and the subsequent additions, including the original cost of the Union and Clairton companies, as well as the cost of the Gary property, for the entire period were $221,459,144.[1] The average investment in these manufacturing properties (exclusive of the Tennessee concern) has been approximately $359,000,000. Of this amount, however, probably not less than $50,000,000, on the average, represents the value of land on which, taken as a whole, there has been no depreciation, but instead a rather marked appreciation. Deducting this figure gives an average of $309,000,000 for the average investment in manufacturing plants (steel works, blast furnaces, etc.). The average annual true depreciation of $10,980,518, above given, is equivalent to 3.6 per cent on this estimated average investment (excluding land). This, at first sight, may seem rather low. However, during this period the expenditures for ordinary maintenance and repairs upon these manufacturing properties, again excluding the Tennessee Coal, Iron and Railroad properties, aggregated approximately $176,500,000 (the expenditures in 1901, which have never been compiled, being estimated). Adding this figure to the total depreciation of $107,060,053, above given, gives a total for maintenance, repairs, depreciation, and obsolescence combined, of $283,560,053, and an average of about $29,000,000 per year, which is equivalent to 9.4 per cent on the average indicated investment of $309,000,000. The Bureau is of the opinion that this is sufficient to fully maintain the property and allow for all actual depreciation and obsolescence.

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[1] There is included in this total the investment of the Gary plant in terminal railroad property, but the amount of this is not large enough to affect the calculations here made to a significant extent.

It will be recalled (see Table 29, p. 269) that the total pig-iron capacity of the Steel Corporation, other than that acquired through the Tennessee Coal, Iron and Railroad purchase, was increased during the period from April 1, 1901, to December 31, 1910, by about 105 per cent, and its steel-ingot capacity was increased by 86 per cent, while its capacity for finished steel products was increased by over 83 per cent. Besides this, as already shown, there was an enormous increase in the capacity of the Corporation's cement works. The total gross expenditures upon its manufacturing properties during this period (including the original cost of the manufacturing properties of the Union and Clairton concerns, as given in Table 35, p. 292) was about $221,450,000. This, it will be seen, is, roughly, 88½ per cent of the total estimated value of $250,000,000 for its manufacturing properties in 1901 as computed by the Bureau. In other words, an addition of 88½ per cent to its investment in these manufacturing properties resulted in an increase of, roughly, from 83 to 105 per cent in their capacity, this not including the great increase in its cement department. These figures do not fairly state the case, since, in addition to this great increase in capacity, there has been extensive modernization of plants, which greatly increased their efficiency.[1]

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[1] It should be pointed out that the figures of increase in capacity here given include the Shelby Steel Tube Company, while the increase in investment does not, since that concern has been treated as one of the original constituent companies. The capacity of that concern was so small, however, that this method of treatment does not appreciably affect the comparison here made.

These figures show, therefore, that the increase in capacity has been rather more rapid than the increase in capital investment. In view of this fact and of the other evidence presented, it appears certain that the adjusted or so-called true depreciation allowances of $107,060,053 for these manufacturing properties, as shown in Table 37, are quite sufficient.

Iron-ore properties.—The estimated exhaustion and depreciation of the iron-ore and timber properties, after adjustments (again excluding the Tennessee property), as shown in Table 37, was $30,293,497. This is over and above ordinary maintenance and repair expenditures on the same properties of approximately $3,200,000.

A part of this item of $30,293,497 represents depreciation of mining improvements and mining equipment, and a small part the exhaustion of timber property. The great bulk of it, however, nominally represents the exhaustion of the ore itself. During the period from 1901–1910, inclusive, the Steel Corporation's production of Northern (Lake) ore was 176,500,000 tons. Had all of this item of $30,293,497 represented exhaustion, therefore, it would have been equivalent to about 17 cents per ton. Even allowing for the other considerations just noted, this allowance appears to be excessive on the basis of valuation arrived at by the Bureau. It will be recalled that in Chapter III the value of the ore property of the Corporation in 1901 was placed at $100,000,000. This included the improvements, the book investment in which at that time was approximately $9,000,000. Deducting this amount leaves a total of $91,000,000 for the ore itself (taking fee ore and leaseholds collectively), which, on the accepted basis of a deposit of 700,000,000 tons, would be equivalent to 13 cents per ton. This, however, takes the fee ore and the leaseholds collectively. So far as the fee ore is concerned, it has been shown that a fair valuation in 1901 would be somewhat less than 15 cents per ton, and it is not likely that the subsequent purchases of fee ore by the Corporation would bring the average of all its fee holdings above that figure. So far as the leaseholds are concerned, any such average would be greatly excessive, since, as pointed out in Chapter III, the value of the equity in these leaseholds held in 1901 can not be considered as worth more than 6 cents per ton. The average investment in the leaseholds subsequently secured was somewhat higher, but the average investment, in all the leased mines which the Corporation operated, during this period would undoubtedly be much less than 10 cents per ton.

It is important to point out that the great bulk of the production of the Steel Corporation's ore thus far has been from leased mines and not from fee properties. In the case of leaseholds secured without the payment of a bonus the Steel Corporation does not have to provide for the exhaustion of the ore itself (which is a matter that concerns the owner of the mines, the lessor), but simply has to provide for the depreciation of its mining improvements and equipment. Where a bonus was paid, the Corporation properly should provide for its extinguishment as well as for the improvements subsequently made. Granting that bonus payments in later years were somewhat higher than those prevailing in 1901, the average investment in all leasehold properties of the Corporation operated during the entire period covered would be very small.

Therefore, since most of the production thus far has been from leased mines, it is certain that if exact data were readily available the allowance made by the Steel Corporation for exhaustion of its ore might be substantially cut down. However, the amount of the reduction, while considerable in itself, would be relatively unimportant as compared with the total investment in the ore property, and, moreover, such an analysis would require a vast amount of detailed information. For these reasons it was deemed better to allow the estimated depreciation and exhaustion of the ore property to stand instead of revising it.

Coal and coke properties.—The estimated true depreciation and exhaustion of the Corporation's coal and coke property, exclusive of Southern coal and coke property, during the period from April 1, 1901, to December 31, 1910, as will be seen from Table 37, was $21,220,986. This was over and above expenditures of something in excess of $12,000,000 on the same properties for ordinary maintenance and repairs. The great bulk of this item of $21,220,986 represents the exhaustion of coal in the ground, although a portion of it represents depreciation of coke ovens and other equipment. The amount which may be regarded as the exhaustion proper, is equivalent to about 10 cents per ton for coking coal in the ground; the depreciation of coke ovens and other equipment, and the exhaustion of other coal make up the remainder. Taking good Connellsville coal land at an average cost of $1,200 per acre, and assuming an average yield per acre of 10,000 tons, the value in the ground would be about 12 cents per ton. This average, however, is undoubtedly somewhat in excess of the true cost of the Corporation's Connellsville coal; therefore an allowance equivalent to 10 cents per ton for exhaustion of such coal seems sufficient.

Railroad properties.—The estimated depreciation of the railroad property, as given in Table 37, after revision, was $26,636,266. This includes an allowance of $6,712,612 for obsolescence. The estimated depreciation seems too high in view of the very liberal expenditures for ordinary maintenance and repairs, which, for the ten-year period, were, roughly, $54,000,000 (estimating the 1901 expenditures at $2,000,000 and excluding the Tennessee property in both instances). It is a fair question, in view of the large expenditures for maintenance and repairs, whether anything should be allowed for depreciation of this property. However, since there is a reasonable doubt on this point, the Bureau has allowed the adjusted amount in its calculations.

This estimated depreciation of $26,636,266 and, likewise, the net outstanding depreciation of $18,972,689 include the above-mentioned allowance of $6,712,612 for obsolescence, as distinct from depreciation proper. Ordinarily, it has not been possible to show what has been allowed for obsolescence specifically, but the records of certain railroads were kept in such a way as to permit this. It is probable that the Corporation is justified in the case of certain of its railroads in making some allowance for obsolescence. With respect to its Lake ore railroads in particular, it is the opinion of the Corporation's experts that when the ore is eventually exhausted there will be very little business for these railroads and that they will lose the great bulk of their value. This is a debatable question, and, moreover, the probable life of the ore deposits extends so far into the future as to call for only a very small amount of obsolescence per annum at best. While, however, the allowance actually made seems somewhat excessive, nevertheless the Bureau has not reduced it.

The Steel Corporation takes the position that while it is justified in deducting this estimated obsolescence from its earnings, no deduction should be made from the investment so long as these railroads are in active operation. In other words, the Corporation contends that the provisions for obsolescence, while deducted annually from the earnings, should not be deducted from the investment until a distant date when the so-called estimated, or expected, obsolescence becomes an accomplished fact.

The Bureau has not accepted this view of the Corporation, although admitting that the question is a debatable one, but instead has deducted this amount from the investment as well as from the earnings. (See p. 340.)

STEAMSHIP PROPERTIES.—The estimated true depreciation of the steamship properties, it will be seen, was $9,697,348, or at the rate of almost exactly $1,000,000 a year for the nine and three-fourths year period. During this interval, moreover, several millions of dollars were expended upon these properties in ordinary maintenance and repairs.

It will be recalled that the value of the steamship property of the Corporation at its organization in 1901 was placed at $20,000,000. On this basis, without allowing for subsequent additions, the depreciation allowance here given would amount to almost exactly 5 per cent per annum. This does not appear excessive. On the other hand, in view of the fact that the ordinary maintenance and repair expenditures cover a good many items which might possibly come under the head of depreciation, it has been accepted as sufficient. Of this total estimated true depreciation of $9,697,348, only $5,115,123 had been made good, leaving a net outstanding depreciation of $4,582,225.

MISCELLANEOUS FIXED PROPERTIES.—The estimated depreciation of these miscellaneous properties (chiefly detached dock property, natural gas, and limestone), aggregating $5,245,967, appears reasonable and may be accepted without discussion.

TENNESSEE COAL, IRON AND RAILROAD COMPANY'S PROPERTIES.—In the case of these properties, the total provisions for depreciation were allowed to stand without deduction.

SUMMARY.—It would appear, therefore, that the revised allowances for true depreciation of the various properties, while liberal, are in the main reasonable, and they have been used by the Bureau. As already shown, a considerable part of this estimated depreciation, exhaustion, and obsolescence had been made good by actual expenditures on the property. Therefore, in order to ascertain the true investment in the properties at the close of 1910, there should be deducted, not the total amount of the true depreciation as thus estimated, but only that portion of such amount which had not actually been made good up to that date; in other words, the so-called unrestored balance, or net outstanding depreciation. The total of this amount for all properties, as already stated (including blast-furnace relining), was $89,481,674.

Section 7. Net additions to the tangible property of the Steel Corporation, 1901–1910.

FIXED PROPERTIES.—The net outstanding depreciation above arrived at covered not only the original property of the Steel Corporation but also the additions thereto up to the close of 1910. For convenience, however, this outstanding depreciation may be set against the capital additions to the fixed properties of the Corporation, as given in Table 35, page 292, in order to arrive at what may be called the total net additions to such property during this period. This is done in Table 38, on page 310, below, which gives first the total gross capital additions, as stated in Table 35, then the deductions for net outstanding depreciation as given in Table 37, leaving a total which represents net capital additions to these fixed properties for this period.

NET ADDITIONS TO OTHER ASSETS.—In the case of the assets other than fixed properties, the figures of increases given in Table 32, on page 280, are net. It may be noted that the net current assets, as there stated, include in the inventories certain bookkeeping profits which have been nominally made by some subsidiary concerns on the sale of such materials or products to other subsidiary companies, but which have not been actually realized because such products have not been sold to an outside interest. The Corporation in its annual reports since 1904 has deducted such "locked up" or "deferred" profits, as they may be called, from its operating profits before arriving at what it terms its net earnings. This matter is more fully discussed in the chapter on profits. (See p. 333.) Had the Bureau adopted the Corporation's present practice of deducting the deferred intercompany profits in inventories from the earnings, a corresponding deduction from the investment would also have been necessary. While the Corporation's practice in this respect is conservative, for the purposes of this discussion the Bureau determined not to deduct deferred intercompany profits from the earnings, nor to make the corresponding deduction from investment. The table showing the net additions to the investment from 1901 to 1910 follows:

TABLE 38.—NET ADDITIONS TO INVESTMENT OF STEEL CORPORATION, APRIL 1, 1901, TO DECEMBER 31, 1910.

Description.	Total additions, as per Table 35.	Estimated true depreciation.	Amount made good by expenditures not capitalized.	Net outstanding depreciation to be deducted from investment.	Net additions to investment.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):					
Manufacturing	$151,480,449	$107,060,053	$88,918,509	$18,141,544	$133,338,905
Iron ore	62,093,931	30,293,497	2,345,016	27,948,481	34,145,450
Coal and coke	34,112,303	21,220,986	5,534,665	15,686,321	18,425,982
Transportation	74,541,029	37,336,955	13,462,331	23,874,624	50,666,405
Miscellaneous fixed property	5,548,556	4,242,626	1,435,082	2,807,544	2,741,012
Other assets:					
Deferred charges	13,243,678				13,243,678
Investments	2,128,364				2,128,364
Sinking funds	16,067,666				16,067,666
Net current assets	101,683,544				101,683,544
Total	460,899,520	200,154,117	111,695,603	88,458,514	372,441,006
Gary plant [1]	69,978,695				69,978,695
Tennessee Coal, Iron and R. R. Co. [2]	60,468,518	2,856,003	1,832,843	1,023,160	59,445,358
Sundry adjustments	3,063,594				3,063,594
Grand total	594,410,327	[3] 203,010,120	113,528,446	[3] 89,481,674	504,928,653

[1] Includes city of Gary and railroad property. The figure is the construction cost. Depreciation of this plant is included in the figures given above. The total amount of accrued depreciation—not including certain amounts for terminal railroad property which could not be segregated—was $1,239,393.

[2] Original cost of fixed property plus subsequent additions.

[3] Excluding an item of $385,181 which could not be distributed.

Section 8. Total investment in tangible property of Steel Corporation, December 31, 1910.

In the following table the total net additions to the property of the Steel Corporation from 1901 to 1910, as given in Table 38, are added to the investment of the Corporation on April 1, 1901 (see Table 23), thus giving what may be regarded as the total investment in the properties of the Corporation at the close of 1910; as previously noted, the cost of the Gary plant and of the Tennessee Coal, Iron and Railroad Company are stated separately instead of being distributed. In this table the other assets are given by classes and in exact figures, instead of in a single round sum, as in Table 23.

TABLE 39.—INVESTMENT IN TANGIBLE PROPERTY OF STEEL CORPORATION ON DECEMBER 31, 1910, AS COMPUTED BY BUREAU.

Description.	Investment 1901.	Net additions 1901–1910.[1]	Total investment Dec. 31, 1910.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):			
Manufacturing	$250,000,000	$133,338,905	$383,338,905
Iron ore	100,000,000	34,145,450	134,145,450
Coal and coke	80,000,000	18,425,982	98,425,982
Transportation	91,500,000	50,666,405	142,166,405
Miscellaneous fixed property	24,000,000	2,741,012	26,741,012
Other assets:			
Deferred charges	2,088,027	13,243,678	15,331,705
Investments	241,030	2,128,364	2,369,394
Sinking funds	239	16,067,666	16,067,905
Net current assets	134,224,089	101,683,544	235,907,633
Total	682,053,385	372,441,006	1,054,494,391
Gary plant [2]		69,978,695	69,978,695
Tennessee Coal, Iron and Railroad Company		[3] 59,445,358	59,445,358
Sundry adjustments [4]		3,063,594	3,063,594
Grand total	682,053,385	504,928,653	1,186,982,038

[1] As per Table 38.

[2] Includes city of Gary and railroad property. See note 1 to Table 38.

[3] Original cost of fixed property and additions thereto since its acquisition.

[4] Sundry adjustments made in the balance sheet without distribution by classes of property.

It should be repeated that the Bureau's figures of investment do not necessarily represent the *value* of such investment in 1910. So far as the properties other than natural resources—ore, coal, natural gas, and land—are concerned, it is reasonably safe to place the value at about the known cost, after allowing for depreciation in the manner above explained. With respect to the natural resources of the Corporation, however, the case is different. In some instances the value may have decreased or disappeared altogether. In general, however, the value of these classes of property, particularly of ore property and land, has increased. Undoubtedly, this increase in the value of the ore (and, to a less extent, of the coking-coal property) has been due in considerable measure to the great concentration of ownership of such property during the past ten years and, to no small extent, to the very substantial concentration of such ownership in the hands of the Steel Corporation alone. This matter is discussed elsewhere. (See p. 325.) At the moment it is desired simply to emphasize that the mere addition of the cost of such natural resources, secured since April, 1901, to their estimated value on that date may not give a fair indication of their value at the present time. The following table gives the net investment in the property of the Steel Corporation at the close of each year from 1901 to 1910, arrived at by adding to the original investment in 1901 the gross additions as given in Tables 32 and 33 and deducting from the combined results the net accrued or outstanding depreciation as given in the last column of Table 37. The current assets as given are net. (See note 7 to Table 32.)

TABLE 40.—TOTAL INVESTMENT OF STEEL CORPORATION IN TANGIBLE PROPERTY, AS REVISED BY BUREAU, BY CLASSES, AFTER DEDUCTIONS FOR NET ACCRUED DEPRECIATION, AT CLOSE OF EACH YEAR, 1901-1910.

Description.	1901.	1902.	1903.	1904.	1905.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):					
Manufacturing	$256,988,756	$278,630,273	$300,317,051	$317,883,734	$323,879,618
Iron ore and timber	101,836,880	109,934,668	109,544,653	110,991,640	111,286,611
Coal and coke	80,300,648	86,879,373	89,555,933	91,067,136	93,932,620
Transportation	91,421,116	93,281,569	97,330,868	98,607,182	105,024,040
Miscellaneous fixed property	24,585,185	24,480,613	24,899,687	24,926,627	26,404,163
Other assets:					
Deferred charges	1,737,456	1,633,391	2,177,046	2,440,739	3,197,723
Investments	3,871,954	1,874,872	2,412,149	1,920,176	1,180,343
Sinking funds	245,319	1,388,862	3,607,448	6,958,449	16,736,553
Net current assets [1]	138,110,545	165,007,905	176,070,249	162,770,486	191,881,062
Sundry adjustments	*228,103*	463,393	700,895	671,974	1,318,187
Grand total	698,869,756	763,574,919	806,615,979	818,238,143	874,840,920

Description.	1906.	1907.	1908.	1909.	1910.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):					
Manufacturing	$337,456,214	$364,441,140	$380,145,004	$379,465,023	$383,338,905
Iron ore and timber	113,771,916	119,879,749	126,212,969	130,474,304	134,145,450
Coal and coke	93,354,423	95,557,205	96,376,451	98,165,272	98,425,982
Transportation	114,052,751	127,013,556	131,947,097	133,867,228	142,166,405
Miscellaneous fixed property	26,409,597	26,236,798	26,390,851	26,383,107	26,741,012
Other assets:					
Deferred charges	4,272,622	6,204,734	9,106,666	12,763,191	15,331,705
Investments	1,617,351	1,717,120	3,083,000	2,353,110	2,369,394
Sinking funds	27,443,945	32,442,402	23,263,035	21,738,953	16,067,905
Net current assets [1]	222,895,896	229,347,482	196,190,322	229,873,440	235,907,633
Gary plant [2]	4,720,159	24,063,388	42,797,229	53,905,844	69,978,695
Tennessee Coal, Iron and Railroad Company		49,842,295	53,009,973	56,031,697	59,445,358
Sundry adjustments	1,403,010	2,017,733	1,902,890	1,854,824	3,063,594
Grand total	947,397,884	1,078,763,602	1,090,425,487	1,146,875,993	1,186,982,038

[1] See note 7, Table 32.

[2] See note 1, Table 38.

In Table 44, on page 328, this net investment is stated in the form of a constructive balance sheet. The property account is there given in total instead of by classes, while the current assets are given in gross as well as the current liabilities instead of simply stating the net current assets as in Table 40.

Section 9. Comparison of Bureau's figures of investment in tangible properties of Steel Corporation at the close of 1907 with the Corporation's estimate of their value on that date.

Before discussing further the indicated investment of the Corporation at the close of 1910, it is desirable to present the figures of investment up to the close of 1907, for the reason, already noted, that the Steel Corporation itself made an appraisal of its properties as of that date. This appraisal was apparently made with considerable care. The various properties of the Corporation were itemized in great detail. The figures for manufacturing properties were largely based on the known or estimated construction cost and not on an engineering appraisal. The real estate and natural resources, however, were entered at the estimated current value. The real estate was valued separately from the improvements thereon, while in the case of ore properties the holdings were carefully scheduled and the tonnages estimated, both by ranges and by qualities.

This valuation by the Corporation of its various properties at the close of 1907 is compared in Table 41 with the investment in these properties as computed by the Bureau, this being arrived at by adding to its figures of value on April 1, 1901, the net additions thereto up to the close of 1907, computed in the same manner as in Table 38. The Corporation's figures, like those of the Bureau, take account of depreciation.

TABLE 41.—BUREAU'S ESTIMATE OF INVESTMENT IN PROPERTY OF STEEL CORPORATION AT CLOSE OF 1907 COMPARED WITH CORPORATION'S ESTIMATE OF VALUE AT THAT TIME.

Description.	Investment as computed by Bureau, Dec. 31, 1907.	Value as estimated by Corporation.	Difference.
Fixed property (exclusive of Gary and Tennessee Coal, Iron and Railroad Company):			
Manufacturing	$364,441,140	$367,632,230	$3,191,090
Iron ore and timber	119,879,749	[1] 641,242,880	521,363,131
Coal and coke	95,557,205	142,521,913	46,964,708
Transportation	127,013,555	145,048,041	18,034,486
Miscellaneous fixed property	26,236,798	19,619,052	[2] *6,617,746*
Other assets:			
Deferred charges	6,204,734	...	[3] *6,204,734*
Investments	1,717,120	...	[3] *1,717,120*
Sinking funds	32,442,402	32,442,402	...
Net current assets	229,347,483	229,347,483	...
Total	1,002,840,186	1,577,854,001	575,013,815
Gary plant [4]	24,063,388	24,063,388	...
Tennessee Coal, Iron and Railroad Company	49,842,295	49,747,753	[5] *94,542*
Sundry adjustments	2,017,733	...	[3] *2,017,733*
Grand total	1,078,763,602	1,651,665,142	572,901,540

[1] Includes about $5,700,000 of timber property.

[2] This excess of the Bureau's figure over that of the Corporation is chiefly due to the fact that in computing the investment in 1901 the Bureau allowed a very liberal valuation. The Corporation contends that its 1907 appraisal of these properties was very conservative.

[3] Excess over Corporation's estimate, which did not include these items specifically, but which, however, allows for most of them in other items.

[4] Includes city of Gary and railroad property.

[5] Excess over Corporation's estimate.

It will be seen at once from this table that the most marked differences between the investment as computed by the Bureau and the valuation as arrived at by the Corporation occur in the case of the iron-ore property (including timber) and the coal and coke property. In the former the excess of the Corporation's figure over that of the Bureau is more than $521,000,000, while the excess in the case of the coal and coke is nearly $47,000,000.

The Corporation's valuation of its manufacturing properties naturally agrees very closely with that of the Bureau because the Bureau's figure was partly based upon that of the Corporation. (See p. 188.) Moreover, the Corporation's figures for these manufacturing properties are stated to be substantially the construction cost. The real estate, however, was put in at the appraised current value.

It may be noted that blast-furnace valuations frequently ran in excess of $750,000 per furnace, and in some instances above $1,000,000; some of the larger furnaces, in fact, were valued at more than $1,500,000.

The land valuations often were very high. Thus, land in the Pittsburg district was frequently valued at $20,000 per acre, in several cases at as much as $50,000, while in one instance the valuation ran as high as $300,000 per acre, and there were several instances where the valuations were as much as $100,000 per acre. The extreme prices named were for exceptionally valuable parcels of real estate, sometimes in central locations in a city. However, the figures generally indicate a liberal basis of valuation.

The Corporation's appraisal value of its transportation properties, it will be noted, exceeds the Bureau's figure of investment by about $18,000,000. This, on the whole, is not an extraordinary difference, but the Bureau regards its own figure as sufficiently liberal.

The Bureau's figure for the Gary plant is the Corporation's figure of construction cost. It will be observed that this is given in a single total, and not classified. The Gary plant has no ore or coal property, and the great bulk of the investment is in manufacturing plants. It has, however, an extensive investment in transportation property, and some investment in miscellaneous property. Since, however, the Corporation in its appraisal did not classify this property, it was not necessary for the Bureau to make a distribution of the total cost. The depreciation of this plant is not shown separately, as complete data were not available; the total amount (see note 1, p. 310) was small. The Bureau, for reasons already stated, entered the Tennessee Coal, Iron and Railroad property at its cost as computed by the Corporation, including expenditures made after the purchase in 1907. (See p. 289.)

The excess of approximately $17,000,000 in the Corporation's figure for its coal and coke property over that of the Bureau is principally due to the fact that the Corporation was dealing with an appraised valuation whereas the Bureau's figure largely represents the investment cost (in other words, the valuation in 1901 plus the actual cost of subsequent additions), and does not allow for any appreciation during this interval. As a matter of fact, there had been some appreciation in this property, although perhaps not to the extent claimed by the Corporation. A part of this appreciation, it should be noted, must be attributed to the concentration of the most desirable coking-coal lands in the hands of the Steel Corporation.

An idea of the liberal basis upon which coal and coke valuations were computed by the Corporation may be obtained from the mere statement that considerably more that one-half of its coking coal was entered at an average valuation of $1,750 per acre, while the lowest valuation for any coking coal, with the exception of a small tract of about 250 acres, was $1,200 per acre. The latter valuation applied to coking coal in the so-called Klondyke region. Its steam coal was put in at $350 per acre. These valuations are undoubtedly high.

The bulk of the coke-oven property of the Corporation was valued on the basis of $1,400 per oven. Although this covered improvements to mines, machinery, and equipment, this average nevertheless seems high.

In the case of the miscellaneous fixed property the Bureau's figure of investment is $26,236,798, as against an appraised valuation by the Corporation of $19,619,052. The excess of the Bureau's figure over that of the Corporation is partly due to the fact that the Bureau undoubtedly allowed a very liberal valuation for the natural-gas property in 1901, namely, $20,000,000, the full amount claimed by the Steel Corporation in the Hodge suit. (See p. 182.) In this 1907 appraised valuation, on the other hand, this natural-gas property was valued by the Corporation at only about $10,300,000. While the property had suffered considerable exhaustion during this period, nevertheless the Corporation's appraisal in 1907 was on a very much more conservative basis than that in 1902. The Corporation, in fact, claims that its 1907 valuation was altogether too conservative, and that these natural-gas properties were easily worth $20,000,000 to $25,000,000.

Therefore, as in the case of the Corporation's estimate submitted in the Hodge suit in 1902, the principal difference between its figures and those of the Bureau in this comparison for 1907 lies in the item of iron ore. As just shown, the excess of the Corporation's estimate of the value of its ore property over the Bureau's estimate of the investment in that property at the close of 1907 is approximately $521,000,000. It may be conceded that the Bureau's figure of investment somewhat understates the value of this ore property on that date, since it is known that there had been some appreciation in the value of iron-ore properties during the period from April 1, 1901, to December 31, 1907. An accurate valuation of the ore property of the Corporation at the close of 1907 is an extremely difficult matter because of the effect of the great concentration of ownership or control of ore property upon such values. Where a very few holders own or control the great bulk of a given natural resource of this sort, and are indisposed to sell, the values may not only be artificially enhanced but also difficult to determine.

It is unnecessary and somewhat impracticable to attempt a quantitative valuation of the ore property of the Steel Corporation in 1907, because of the influence of concentration of control just noted. However, it is very easy to show that the valuation of approximately $640,000,000 claimed by the Corporation is grossly excessive. Of the total as stated, approximately $607,000,000 was for the ore itself (taking fee property and leaseholds together), as distinct from the improvements. This valuation covered a total of approximately 1,182,000,000 tons, thus giving an average of 51 cents per ton (taking fee ore and leaseholds collectively). This total tonnage, it may be noted, does not include the extensive deposits acquired through the Hill lease, discussed below; on the other hand, nothing was entered in the Corporation's valuation for this Hill ore property except for certain expenditures for development work and for advanced royalties.

Any such average valuation of 51 cents per ton for the ore property of the Steel Corporation at the close of 1907 is inadmissible. This valuation could easily be discredited by discounting the average rate of royalty on new leases taken out during the period from 1901 to 1907, computed in the same way as has already been done in discussing the value of the original ore property of the Steel Corporation in Chapter III. (See pp. 216–228.) Such a detailed discussion, however, is unnecessary. Convincing evidence that this valuation of $607,000,000, claimed by the Steel Corporation for its ore in 1907 is excessive is afforded by the mere statement of the actual cost of this ore property. Thus, the total capital expenditures by the Corporation upon its ore property from April 1, 1901, to the close of 1907, before deducting depreciation, were $38,600,000. Of this total approximately $19,000,000 represents the expenditure for ore, including fee and leasehold properties collectively as distinct from improvements. By this expenditure of approximately $19,000,000 (of which nearly $9,000,000 was for the Union and Clairton ore) the Steel Corporation added to its ore reserves (again taking fee properties and leaseholds together) several hundred million tons of ore, this again excluding the "Hill" ore. The exact amount added can not be stated because large increases in the estimated total have been made by proving up ore lands held in 1901. Moreover, the amount assumed or estimated to have been added, at the time of purchase, rather than the amount actually proved by later development to have been added, is the really significant fact. It is entirely conservative to place the additions from this expenditure of $19,000,000, as currently estimated at the time, at several hundred million tons. This means that the average cost per ton of the ore acquired since 1901 (again treating fee and leaseholds collectively) was only a few cents, whereas the total value claimed by the Steel Corporation at the close of 1907 was equivalent to over 50 cents per ton. While, as already pointed out, the original cost of a mining property is not a reliable indication of its value after subsequent development, it is incredible that during this interval of less than seven years fee ore and leaseholds which cost, on the average, only a very few cents per ton could have increased to a value of as much as 50 cents per ton. In this connection it may be noted that the average rate of royalty on new leases taken out by the Steel Corporation in the Lake Superior region from 1907 to 1910, inclusive, apparently is not over 40 cents per ton (see p. 321), as compared with an average rate for old and new leases combined, in 1901, of about 28 cents. The quality of ore covered by the recent leases may have been somewhat lower, but allowing for this the advance in royalties would in no way justify the high valuation placed on its ore by the Corporation in 1907.

A very important consideration to be kept in mind is that the bulk of the Steel Corporation's ore property in 1907 consisted of leaseholds and not ore in fee. Apparently two-thirds at least of the total tonnage was simply leased. For the mining of ore from such leased properties the Corporation must, of course, pay a royalty, so that for this leased property the Steel Corporation simply has an equity interest in the ore. Even if all the new leases had been taken out at the same rate of royalty as prevailed in 1901, it is certain that the value of these equities in the aggregate plus the value of the ore owned in fee would not equal the large total claimed by the Corporation in its 1907 appraisal. As a matter of fact, the royalties on many of these leases were considerably higher than the average of 28 cents prevailing in 1901. This increase in the royalty paid by the Steel Corporation, of course, does not mean any increase in the value of its equity, since as clearly shown on page 205 a royalty payable never represents an asset to the company paying it, but, instead, a cost.

Therefore, the inevitable conclusion is that the Steel Corporation in appraising its ore property in 1907, just as in the case of its estimate in the Hodge suit in 1902, used a very extravagant valuation. It may be noted incidentally that the fact that the average valuation in 1907 of about 50 cents per ton very thoroughly discredits the estimate of $1 per ton used by the Steel Corporation in the Hodge suit in 1902.

Great Northern ("Hill") ore lease.—It will be recalled that on January 1, 1907, the Steel Corporation leased the bulk of the extensive ore holdings of the Great Northern Railway system on the basis of an 85-cent royalty for 59 per cent (dried) ore, with an increase of 3.4 cents per ton each successive year.

This high rate of royalty has frequently been cited in discussions of the ore industry as conclusive evidence of a very pronounced appreciation in the value of ore properties since 1901. The Bureau, however, interprets this transaction in a very different light.

The essential facts in this transaction may, for convenience, be briefly restated:

1. The property leased consists partly of fee ore and partly of leaseholds in Minnesota, covering altogether something less than 40,000 acres of ore lands.

2. The rates of royalty, which include the charges for the rail transportation, as well as dockage charges, were as follows for the year 1907:

Per cent iron.	Royalty per ton.	Per cent iron.	Royalty per ton.	Per cent iron.	Royalty per ton.
49	$1.1680	55	$1.4572	61	$1.7464
50	1.2162	56	1.5054	62	1.7946
51	1.2644	57	1.5536	63	1.8428
52	1.3126	58	1.6018	64	1.8910
53	1.3608	59	1.6500	65	1.9392
54	1.4090	60	1.6982	66	1.9874

with an increase of 3.4 cents per ton every year, for all grades specified above.

3. The minimum tonnage upon which royalty must be paid is very high, as follows: For 1907 a minimum of 750,000 tons, with a cumulative additional minimum of 750,000 tons for each year thereafter until 1917, when the minimum will reach 8,250,000 tons, remaining fixed at that figure until the expiration of the lease.

4. The Great Western Mining Company, the lessee (a subsidiary of the Steel Corporation), agrees to ship all the ore over the Great Northern Railway to the port of Superior, on Lake Superior.

5. The term of the lease extends, with respect to fee ore, "until all merchantable ore 49 per cent and richer in iron shall have been shipped;" and, with respect to leaseholds, during the "term of the leases under which such lands are held, less three months."

6. A special provision in the agreement, however, permits the cancellation of the lease by the Steel Corporation on January 1, 1915, upon giving two years' previous notice.

For ore less than 49 per cent, the total charge is fixed at $1.10 per ton without change or annual increase, provided that if any ores are mined from subleases on which there is a higher royalty payment, then the Steel Corporation's royalty shall be equal to that stipulated in the original lease. There were some minor modifications of the arrangement, particularly with respect to the date of payment of dockage charges, and advance royalties, which need not be stated here.

Of these various provisions, there are three which call for particular attention, namely, (1) the very high rate of royalty, with the annual increase of 3.4 cents per ton; (2) the large minimum tonnages, and (3) the right of the lessee to cancel the lease in 1915.

The rate of $1.65 per ton for 59 per cent dried ore for 1907, above given, as already stated in Chapter V, includes the transportation of the ore to Lake Superior, and dockage there. The regular charge for this service has always been 80 cents per gross ton for the railroad in question. Therefore, the base rate of royalty for 1907 may be considered as the difference between this total charge of $1.65 and the 80 cents per ton for transportation and dockage, or, in other words, 85 cents per gross ton.[1]

This net royalty of 85 cents for 59 per cent dried ore, however, applied only in the year 1907. In the next year there was, as already stated, an increase of 3.4 cents per ton, and a further increase of a like amount in every succeeding year, thus making the actual net royalties per ton, yearly, for the period from 1907 to 1916, as follows:

Year.	Net base royalty per ton.	Year.	Net base royalty per ton.
1907	$0.850	1912	$1.020
1908	.884	1913	1.054
1909	.918	1914	1.088
1910	.952	1915	1.122
1911	.986	1916	1.156

This increase of 3.4 cents per ton, yearly, is equivalent to 4 per cent simple interest on the original net royalty of 85 cents per ton. The same addition, however, was made for all ore of 49 per cent iron content and above, irrespective of quality. Therefore, for the lower grades, this addition of 3.4 cents per ton is equivalent to a little more than 4 per cent. On the other hand, of course, in the case of the higher grades of ore, it would be somewhat less than 4 per cent.

The royalties thus far paid under the lease indicate that the ore which has been extracted runs only a little less than 59 per cent iron content when dried. Such ore corresponds approximately to a 53 per cent ore in its natural state.

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[1] The net royalties for the other grades of ore, as already stated, varied in accordance with a sliding-scale arrangement. These royalties in 1907, less transportation charges, would have been as follows:

Per cent iron.	Royalty, net, per ton.	Per cent iron.	Royalty, net, per ton.	Per cent iron.	Royalty, net, per ton.
Under 49	$0.3000	55	$0.6572	62	$0.9946
49	.3680	56	.7054	63	1.0428
50	.4162	57	.7536	64	1.0910
51	.4644	58	.8018	65	1.1392
52	.5126	59	.8500	66	1.1874
53	.5608	60	.8982		
54	.6090	61	.9464		

For each successive year after 1907 there is also an increase of 3.4 cents per ton for ore of 49 per cent and over.

This base rate of royalty in the Hill lease was far in excess of the going rates for similar ore at this time, and, taken in connection with the annual increment of 3.4 cents per ton, which was a very extraordinary provision, these royalties were unprecedented. It is true that occasional leases had been made at as high as a dollar per ton, without, however, any annual increment for interest. But such leases were decidedly exceptional, and also applied to comparatively small parcels of ore of superior quality or availability. The royalty rates on new leases for the Steel Corporation during the period from 1907 to 1910 were very much lower, and none of them approached that of the Hill lease. The following tabular statement shows substantially the terms of royalty for all leases of Mesabi Range properties made by the Steel Corporation from 1907 to 1910, inclusive, including renewals of former leases.

TABLE 42.—RATES OF ROYALTY STIPULATED IN LEASES MADE BY THE STEEL CORPORATION (INCLUDING RENEWALS) OF ORE PROPERTIES IN THE MESABI RANGE, 1907-1910.

Mine.	Royalty.	Mine.	Royalty.
I. Renewals or extensions of prior leases:		III. Other leases, 1907-1910:	
Park Lot	$0.60	[1]	$0.75
Oscar Mitchell lease	.25	[1]	[4].35–.45
II. Leases made, 1907-1910, but under option previous thereto:		Republic Forty	[5].35
		[1]	.75
[1]	[2].35–.60 [3].20–.45	[1]	.75
		[1]	.25–.35
[1]	.25	[1]	.25
[1]	.36	Simple average all leases (using means where royalty takes form of a range of price)	.4373
[1]	.50		
Mooswa lease	.25		

[1] Not designated by name of mine but by surveying specifications.

[2] Ore over 58 per cent iron and under 0.05 per cent phosphorus, advancing from 1908 to 1928.

[3] Other ore advancing from 1908 to 1928.

[4] Thirty-five cents for first five years.

[5] Taken for surface purposes and not considered valuable for ore.

The average rate of royalty for these Mesabi Range properties during this period was, therefore, about 44 cents per ton.

The Steel Corporation during this period entered into a few new leases or renewals of leases on the old ranges and also in the Baraboo district—less than a dozen in all. Most of the leases of old range properties provided for a sliding-scale royalty dependent on the price of ore at Cleveland. It is impossible, therefore, to say what the royalty at any future time will be. Using the highest price for ore at Cleveland thus far reported—$5 per ton—the average royalty in these leases would be under 40 cents per ton. The royalties in the Baraboo leases ranged from only 10 to 20 cents per ton, the ore in this district being of a rather low grade.

Since the Hill properties leased by the Steel Corporation were all on the Mesabi Range, it seems fairer to use the average for that range only for comparison with these recent leases by the Corporation, although the average for this region is higher than that for all leases made by the Corporation in these years in the entire Lake district. The average rate for all the leases, excluding those in the Baraboo district, as nearly as can be computed from available data would be less than 40 cents.

It is believed that the average content of the ore covered by the Mesabi leases listed in the foregoing table is not very far from 53 per cent—or 59 per cent when dried—the base grade in the Hill lease. Therefore, it seems entirely fair to compare the average royalties shown by the above table with the royalty for 59 per cent dried ore, as stipulated in the Hill lease. Extensive data gathered by the Bureau for the average yield of Lake ores used in blast furnaces from 1902 to 1906, inclusive, covering a large percentage of the Lake ore sold and used in these years, show an average natural iron content of about 53.9 per cent. By far the greater part of this was Mesabi ore.

It will be seen that in only three of the leases mentioned in the foregoing table, namely, the three leases at a 75-cent royalty, do the royalties approach anywhere near the base royalties of the Hill lease for the year 1907, and when account is taken of the fact that the Hill royalties increase each year, the disparity is all the more marked.

The question, therefore, arises as to why the Steel Corporation entered into this lease under the onerous conditions noted. The only reasonable explanation which the Bureau has found for this unusual transaction is that it was designed to prevent this ore from falling into the hands of competitors of the Corporation. Had this ore been sold or leased in small parcels to a large number of independent producers, this might have tended to depress the price of ore as well as to foster competition in the manufacture of iron and steel. On the other hand, if these ore lands were simply held by the Great Northern interests without development, this would leave the opportunity open for the organization of a very important rival to the Steel Corporation. At this time, however, the Steel Corporation was the only concern in the iron and steel business which was in a position to consider the acquisition of these Hill ore lands in a single block. By securing control of these enormous reserves the Steel Corporation obviously strengthened its control of the ore industry and at the same time put substantial obstacles in the way of further competition in the iron and steel industry.

The Steel Corporation specifically denies that this lease was intended thus to head off competition, and, instead, contends that it was desired merely in order to strengthen the Corporation's ore reserves. At the time this lease was entered into, however, the Corporation had fully a thirty years' supply (and perhaps a fifty years' supply) of ore under its control. Had this Hill ore been acquired at a bargain price, an obvious reason for its acquisition would be furnished; but in view of the extraordinarily high rate of royalty at which this ore was taken over and the other onerous conditions in the lease, particularly the high minimum tonnage stipulated, the only reasonable explanation, in the opinion of the Bureau, is that the Corporation chiefly desired to forestall competition. The high royalty named in this lease, therefore, instead of being proof of a marked appreciation in ore values, is rather an indication of the extent to which the Steel Corporation was ready to go in order to prevent this ore from falling into the hands of rival interests.

In view of the exceptionally high royalties stipulated in this lease, it is hardly surprising that the Steel Corporation did not claim, in its appraisal of 1907 above discussed, any value for this lease in the schedule of its assets.

Considering the great value which has been claimed for it by some writers upon iron and steel matters, this fact is at least interesting. Obviously, however, a lease at a royalty far above the going rate of royalty for ore of similar character has no transfer value and therefore no equity value which would warrant the Corporation in treating it as an asset. Indeed, in view of the extremely high rate of royalty and the high minimum requirements, this lease may perhaps be regarded as an onerous burden rather than an asset.

In this connection, the clause in the lease which permits the Steel Corporation on two years' notice to cancel the lease on January 1, 1915, is perhaps significant. Indeed, there have been rather definite intimations by officials of the Corporation that this option may be exercised.

Section 10. Comparison of the investment of the Steel Corporation at the close of 1910 with its capitalization at that date.

The Steel Corporation has made no detailed appraisal of its various properties since the close of December, 1907. The investment in these properties at the close of 1910, as computed by the Bureau, has already been given in Table 39, on page 311. This investment may now be compared with the total capitalization of the Corporation. This is done in the following table, which also gives a similar comparison for each year of the period 1901–1910. Purchase-money obligations and sundry mortgages are here as elsewhere included as part of the capitalization. (See also Table 41, p. 328.)

TABLE 43.—COMPARISON OF TOTAL INVESTMENT IN TANGIBLE PROPERTY OF STEEL CORPORATION, AS COMPUTED BY BUREAU, WITH OUTSTANDING CAPITALIZATION YEARLY, 1901-1910.

Year ended Dec. 31—	Total capitalization.[1]	Total investment in tangible property as computed by Bureau.	Intangible considerations and water.
1901[3]	$1,402,846,817	[2]$682,053,385	[2]$720,793,432
1901	1,398,241,589	698,869,756	699,371,833
1902	1,388,928,478	763,574,919	625,353,559
1903	1,442,605,000	806,615,979	635,989,021
1904	1,444,829,189	818,238,143	626,591,046
1905	1,441,999,234	874,840,920	567,158,314
1906	1,434,971,977	947,397,884	487,574,093
1907	1,474,162,812	1,078,763,602	395,399,210
1908	1,465,976,790	1,090,425,487	375,551,303
1909	1,477,731,505	1,146,875,993	330,855,512
1910	1,468,033,260	1,186,982,038	281,051,222

[1] Including bonds, mortgages, and purchase-money obligations, but excluding unacquired stock of subsidiary companies. (See Table 44.)

[2] The slight difference between these figures and those given on page 239 is due to the fact that the investment there was stated in round numbers.

[3] April 1, 1901.

From this table therefore it appears that the investment in the tangible property of the Corporation increased from $682,053,385 on April 1, 1901, to $1,186,982,038 on December 31, 1910. The excess of capitalization over tangible property investment decreased in the meantime from $720,793,432 to $281,051,222, or by nearly $439,750,000.

It is apparent, therefore, that a considerable part of the "water" in the original capitalization of the Corporation has been eliminated. This comparison, however, does not exactly show the amount of such reduction—first, because it is not claimed that the entire excess of capitalization over tangible property investment in either case is all "water;" and, second, because the capitalization of the Corporation had changed considerably during the interval from April 1, 1901, to December 31, 1910. In the first place, a considerable amount of bonded debt had been retired. On the other hand, a large amount of new bonded indebtedness had been created, or had been assumed, resulting in a net increase in this item. Moreover, in 1903, $150,000,000 of preferred stock was converted into an equal amount of bonds through the so-called "conversion plan," which is fully discussed in Chapter VIII.

The Steel Corporation undoubtedly would contend that there was not a disparity of $281,000,000 between its total capitalization and the actual value of its property at the close of 1910. The total valuation claimed by the Steel Corporation in its balance sheet of 1910 was approximately $1,693,000,000, or about $225,000,000 over and above the outstanding capitalization, as above stated. Of this excess, approximately $164,000,000 was in the form of surplus, and the balance in sundry reserves. This balance-sheet valuation as compiled by the Steel Corporation exceeds the investment as computed by the Bureau by $506,000,000. However, the Corporation's total includes, first, an excessive valuation for its natural resources, particularly ore; and, second, the so-called " merger value " attaching to its various properties because of their combination and coordination under a single control.

With respect to the ore, it is certain that there is no such value in the ore property as the Steel Corporation claims. This has been conclusively demonstrated in the preceding pages, in analyzing the Corporation's appraisal of its ore property in 1907. Furthermore, a large part of whatever actual appreciation has occurred in ore values certainly must have been due to the rapid concentration of ore property in the hands of a few interests, and particularly in the hands of the Steel Corporation itself.

The capitalization of the appreciation in the value of a natural resource, like iron ore, in the absence of competitive ownership, presents a problem of far-reaching importance. Assume, for instance, for the purposes of argument, that the Steel Corporation could prove an actual appreciation in its ore property of, say, $100,000,000. This would mean that a considerable part of such appreciation must be attributed to the concentration of control of such property, since under scattered and competitive ownership there is always a tendency on the part of some holders to sell at a very small profit rather than carry their property without a return thereon and thus to keep down values. If it were conceded that such appreciation could properly be capitalized and used as a basis for distributing profits, then there is nothing to prevent a further recapitalization of this ore property at a still greater appreciation at some time in the future, when the value may be still more greatly influenced by the concentration of control. In this way, it will be seen, a great concern like the Steel Corporation might repeatedly recapitalize its natural resources, and use this capitalization in such a way as to really conceal its true rate of profit. To permit a concern which has acquired control of a very substantial fraction of the total supply of a natural resource, like iron ore, thus to capitalize and recapitalize this property involves, therefore, as just stated, problems of vital interest to the public.

The Steel Corporation attaches great importance to the element of so-called merger value, contending that the mere merging of its various properties under a single control imparts to them collectively a value very greatly in excess of the sum of their respective values as separate entities. It may be conceded that some increase in value is thus brought about. The merging of such properties and their coordination under a single control tends to permit a more economical operation which may fairly be regarded as imparting an additional value to them. A large part of what is ordinarily called merger value, however, is really little more than the increased earning power due to the reduction or elimination of actual or potential competition.

Therefore, it should be apparent that while the merging of various properties under a single control may actually increase their value, and more particularly their earning power, it would be entirely unjustifiable to credit a company having substantial control of an industry, or a high degree of control, with the full amount of such so-called merger value. To allow such a company credit for the full merger value which it might show by reason of increased earnings under these circumstances would involve a fundamental fallacy, since the reasonableness of the earnings themselves must first be established. Under free and fair competition it is generally assumed that the actual rate of earnings is a fair rate. When, however, competition has been substantially eliminated, or restricted, through consolidation, this assumption is no longer valid, and in this case practically the only available test of the reasonableness of the profits is their relation to the actual investment in the property from the operation of which they are derived. Therefore, the Bureau, while admitting that there is a certain element of merger value attaching to the properties of the Steel Corporation, has made no specific addition therefor to the investment in the tangible property as already computed.

In Table 44 there is presented a constructive balance sheet of the Steel Corporation for December 31 of each year from 1901 to 1910, inclusive, compiled by substituting for the inflated property account as shown on the Corporation's books the investment in fixed property as computed by the Bureau. The current liabilities are shown. No surplus is of course shown, because instead the undivided profits retained in the business and added to surplus on the Corporation's books are here used to reduce the item of "intangible considerations and water." It may be noted that the accrued balances of certain contingent and insurance funds carried on the Corporation's balance sheet are not deducted from the investment here, although in discussing profits later the entire amounts set aside from earnings to these funds are allowed. The actual investment at any given time includes of course the amount of such unexpended balances; on the other hand the contingency that they may be needed at any time justifies their exclusion from profits. Of course, as these funds are actually exhausted the investment is correspondingly reduced.

The gross current assets are shown, and not merely the net, these agreeing with the amounts stated in the Steel Corporation's reports. It is necessary, therefore, to deduct the current liabilities in order to arrive at the investment as stated in Table 43.

It may also be noted that the small amount of unacquired stock in subsidiary concerns which in this report has not been treated as a part of the total capitalization of the Steel Corporation is here included.

TABLE 44.—CONSTRUCTIVE BALANCE SHEET OF STEEL CORPORATION, 1901–1910, ESTABLISHED BY SUBSTITUTING BUREAU'S VALUATION OF FIXED PROPERTY FOR CORPORATION'S BOOK VALUATION OF SUCH PROPERTY.

Assets.

	Apr. 1, 1901.	Dec. 31, 1901.	Dec. 31, 1902.	Dec. 31, 1903.	Dec. 31, 1904.	Dec. 31, 1905.	Dec. 31, 1906.	Dec. 31, 1907.	Dec. 31, 1908.	Dec. 31, 1909.	Dec. 31, 1910.
Property account brought forward		$545,500,000	$554,904,482	$593,669,888	$622,349,086	$644,148,292	$661,845,238	$691,168,068	$809,051,863	$858,782,464	$880,147,299
Fixed property additions capitalized		16,680,384	47,981,699	32,955,359	29,426,372	26,772,767	35,153,984	122,963,251	55,721,497	38,564,178	55,067,584
		562,180,384	602,886,181	626,625,247	651,775,458	670,921,059	696,999,222	814,131,319	864,773,360	897,346,642	935,214,883
Estimated true depreciation		11,546,368	16,895,812	16,638,147	15,467,872	21,737,883	23,63[illegible],674	25,054,991	18,124,196	26,218,981	27,687,195
Less property expenditures not capitalized		4,270,466	7,679,519	12,361,986	7,840,706	12,662,062	17,807,520	19,975,535	12,133,300	9,01[illegible],638	9,777,713
Net outstanding or accrued depreciation		7,275,902	9,216,293	4,276,161	7,627,166	9,075,821	5,831,154	5,079,456	5,990,896	17,199,343	17,909,482
Net property account	$545,500,000	554,904,482	593,669,888	622,349,086	644,148,292	661,845,238	691,168,068	809,051,863	858,782,464	880,147,299	917,305,401
Deferred charges to operations [1]	2,088,027	1,737,456	1,633,391	2,177,046	2,440,739	3,197,723	4,272,622	6,204,734	9,106,666	12,763,191	15,331,705
Investments	241,030	3,871,954	1,874,872	2,412,149	1,920,176	1,180,343	1,617,351	1,717,120	3,083,000	2,353,110	2,369,394
Sinking and reserve fund assets	239	245,319	1,388,862	3,607,448	6,958,449	16,736,553	27,443,945	32,442,402	23,263,035	21,738,953	16,067,905
Inventories [2]	71,852,439	92,325,938	104,390,845	107,976,523	94,812,546	113,387,997	119,897,467	136,188,874	143,179,629	163,811,280	176,537,824
Accounts receivable	50,910,861	40,606,458	48,944,190	34,457,369	36,150,517	49,945,172	58,836,772	58,398,454	34,708,118	56,421,438	44,603,273
Agents' balances			1,091,319	1,029,470	733,271	787,662	672,576	835,269	711,044	788,654	696,834
Bills receivable	3,280,190	3,121,320	4,153,291	3,139,457	3,124,243	2,984,067	4,203,933	10,193,707	6,201,532	6,711,427	5,540,181
Stocks and bonds	10,168,824	3,765,400	6,091,340	5,985,509	7,141,737	6,587,809	7,720,349	8,831,154	4,823,800	4,764,254	4,410,794
Cash	56,153,066	52,471,147	50,163,173	63,022,561	60,646,427	58,955,914	75,236,809	59,963,849	49,598,053	58,521,113	56,953,514
Total tangible assets	740,194,676	753,049,474	813,401,171	846,156,618	858,076,3[illegible]7	915,608,478	991,069,892	1,123,827,426	1,133,457,341	1,208,020,719	1,239,816,825
Intangible considerations and water	721,328,839	699,929,211	625,569,473	636,098,135	626,687,[illegible]61	567,249,229	487,597,493	396,161,020	376,191,605	331,474,514	281,671,574
Total	1,461,523,515	1,452,978,685	1,438,970,644	1,482,254,753	1,484,764,058	1,482,857,707	1,478,667,385	1,519,988,446	1,509,648,946	1,539,495,233	1,521,488,399

Liabilities.

Capital stock:											
Preferred	$510,205,743	$510,205,743	$510,281,100	$360,281,100	$360,281,100	$360,281,100	$360,281,100	$360,281,100	$360,281,100	$360,281,100	$360,281,100
Common	508,227,394	508,227,394	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500
Unacquired stock of subsidiary companies	535,407	557,378	215,914	109,114	96,615	90,915	23,400	761,810	640,302	619,002	620,352
Outstanding bonded and debenture debt	362,541,657	362,681,214	360,754,327	568,138,536	571,791,341	567,893,760	562,156,250	600,185,271	593,231,209	606,384,119	596,351,867
Mortgages and purchase-money obligations	21,872,023	17,127,238	9,590,551	5,882,864	4,454,248	5,521,874	4,232,127	5,393,941	4,161,981	2,763,786	3,097,793
Total capital liabilities	1,403,382,224	1,398,798,967	1,389,144,392	1,442,714,114	1,444,925,804	1,442,090,149	1,434,995,377	1,474,924,622	1,466,617,092	1,478,350,507	1,468,653,612
Accounts payable [3]	27,466,680	18,400,156	19,726,686	17,922,048	20,478,150	23,555,291	26,581,941	26,243,236	24,435,039	35,672,196	30,485,091
Bills payable	17,134,803	12,064,047	6,202,502	4,429,484	3,539,135	2,771,218	....	1,052,747	840,500	827,000	813,500
Special amounts due employees and others	7,622,490	5,253,356	4,485,547	3,941,795	2,416,569	936,159	1,077,292	1,057,496	923,845	862,767	886,122
Accrued interest and unpresented coupons	[4] 5,917,318	4,450,893	5,398,573	6,942,393	7,099,481	7,199,971	7,166,344	7,863,914	7,986,038	8,582,550	7,991,373
Preferred-stock dividends payable	....	8,928,992	8,929,919	6,304,919	6,304,919	6,304,919	6,304,919	6,304,919	6,304,919	6,304,919	6,304,919
Common-stock dividends payable	....	5,082,274	5,083,025	....	....	....	2,541,512	2,541,512	2,541,513	8,895,294	6,353,782
Total current liabilities	58,141,291	54,179,718	49,826,252	39,540,639	39,838,254	40,767,558	43,672,008	45,063,824	43,031,854	61,144,726	52,834,787
Total capital and current liabilities	1,461,523,515	1,452,978,685	1,438,970,644	1,482,254,753	1,484,764,058	1,482,857,707	1,478,667,385	1,519,988,446	1,509,648,946	1,539,495,233	1,521,488,399

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[1] Principally advanced mining royalties.

[2] Inventory valuation includes profits accrued to subsidiary companies on materials and products sold to other subsidiary companies and undisposed of at end of year; i. e., intercompany materials were inventoried at cost to the purchasing subsidiary.

[3] Includes accrued labor and taxes.

[4] Includes $2,852,388 accrued dividends of subsidiary companies.

CHAPTER VII.

PROFITS OF THE STEEL CORPORATION COMPARED WITH ITS INVESTMENT.

Section 1. Form of income account.

Having determined approximately the real investment of the Steel Corporation yearly since its organization, it now remains to consider its profits in relation to that investment.

Before making this comparison it is desirable to discuss briefly the form of the income statement of the Steel Corporation, as given in its annual reports, so as to make clear certain rearrangements later made by the Bureau. A copy of this statement for the year 1910, which is substantially representative for all years, follows:

TABLE 45.—PROFIT AND LOSS AND INCOME ACCOUNTS, UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES, FOR YEAR ENDING DECEMBER 31, 1910.[1]

Condensed general profit and loss account.

Gross receipts: Gross sales and earnings		$703, 961, 424. 41
Operating charges, viz:		
Manufacturing and producing cost and operating expenses, including ordinary maintenance and repairs and provisional charges for depreciation	[2]$553, 532, 384. 83	
Administrative, selling, and general expenses, and employees' compensation under bonus plan (not including general expenses of transportation companies)	17, 115, 807. 27	
Taxes (including allowance for corporation excise tax)	9, 161, 436. 95	
Commercial discounts and interest	3, 545, 810. 90	
	583, 395, 439. 95	
Less amount included in above charges for provisional reserves for depreciation now deducted for purpose of showing the same in separate item of charge, as see below	24, 316, 596. 71	
		559, 078, 843. 24
Balance		144, 882, 581. 17
Sundry net manufacturing and operating gains and losses, including idle plant expenses, royalties received, adjustments in inventory valuations, etc	1, 931, 327. 90	
Rentals received	797, 020. 24	
		2, 728, 348. 14
Total net manufacturing, producing, and operating income before deducting provisional charges for depreciation		147, 610, 929. 31

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[1] As given in the annual report for that year.

[2] Includes charges for ordinary maintenance and repairs, approximately $41,000,000.

Other income:		
Net profits of properties owned, but whose operations (gross revenue, cost of product, expenses, etc.) are not included in this statement	$338,231.97	
Income from sundry investments and interest on deposits, etc.	2,786,588.68	
		$3,124,820.65
Total		150,735,749.96
Interest charges:		
Interest on bonds and mortgages of the subsidiary companies	7,124,072.96	
Interest on purchase-money obligations and special deposits or loans of the subsidiary companies	139,380.70	
		7,263,453.66
Balance, being the aggregate earnings of the several companies for the year before deducting provisional charges for depreciation		143,472,296.30
Less net balance of profits earned by subsidiary companies on sales made and service rendered account of materials on hand at close of year in purchasing companies' inventories, and which profits have not yet been realized in cash from the standpoint of a combined statement of the business of the United States Steel Corporation and subsidiary companies		2,417,541.79
Earnings for the year 1910, per income account		141,054,754.51
Less allowance for various depreciation funds		24,316,596.71
Net earnings in the year 1910		116,738,157.80

Consolidated income account.

Total earnings of all properties after deducting all expenses incident to operations, including those for ordinary repairs and maintenance (approximately $41,000,000), employees' compensation under bonus plan, provisional allowance for corporation excise tax, and also interest on bonds and fixed charges of the subsidiary companies, per general profit and loss account		141,054,754.51
Less allowance for the following purposes, viz:		
Sinking funds on bonds of subsidiary companies	$2,176,041.18	
Depreciation and extraordinary replacement funds	22,140,555.53	
		24,316,596.71
Net earnings in the year 1910		116,738,157.80
Deduct:		
Interest on United States Steel Corporation bonds outstanding, viz—		
Fifty-year 5 per cent gold bonds	13,803,376.64	
Ten-sixty year 5 per cent gold bonds	9,563,383.89	
Sinking funds on United States Steel Corporation bonds, viz (representing an allowance for depreciation in addition to the $24,316,596.71 deducted above)—		
Annual installment on fifty-year 5 per cent gold bonds	3,040,000.00	
Annual installment on ten-sixty year 5 per cent gold bonds	1,010,000.00	
Interest on above bonds in sinking funds	1,831,089.47	
		29,247,850.00
		87,490,307.80
Less net balance of sundry receipts and charges, including adjustment of various accounts		83,122.98
Balance		87,407,184.82

Dividends for the year 1910 on United States Steel Corporation stocks, viz:		
Preferred	$25,219,677.00	
Common	25,415,125.00	$50,634,802.00
Surplus net income for the year		36,772,382.82
Appropriated from surplus net income for the following purposes, viz:		
On account of expenditures made on authorized appropriations for additional property, new plants and construction, and for discharge of capital obligations	15,000,000.00	
Specifically set aside for account of construction expenditures at Gary, Ind., plant	10,000,000.00	
For reserve fund to cover advanced mining royalties	1,000,000.00	26,000,000.00
Balance of surplus for the year		10,772,382.82
Undivided surplus on December 31, 1909	95,401,395.51	
Less charges during the year 1910 against the foregoing balance	735,059.66	94,666,335.85
Total undivided surplus December 31, 1910, exclusive of capital surplus provided in organization and of subsidiary companies' intercompany profits in inventories		105,438,718.67

The primary purpose of the foregoing statement is, of course, to furnish the stockholders or the investing public such information on earnings and profits as will show the total amount available for interest and dividend distribution, and the amount of surplus remaining. The figures as here given embrace the combined statements of the various subsidiary concerns controlled by the Steel Corporation. The gross sales and earnings, therefore, as given here are the gross receipts from sales of the various products manufactured, *including intercompany operations*, and the gross earnings of the various transportation and miscellaneous companies. From these gross sales and earnings are deducted the manufacturing and producing costs and operating expenses. These manufacturing and producing costs are the aggregate costs of the subsidiary companies, including payments of one subsidiary company to another for materials, and include all the customary items, such as cost of raw materials, labor, and other conversion costs; also the expenditures for ordinary maintenance and repairs discussed in Chapter VI, and, moreover, the "provisional charges for depreciation." Some of these provisional depreciation allowances are, as previously stated, merely charges for the bond sinking funds of subsidiary companies and are not technically a part of this manufacturing and producing cost, nor of depreciation, although treated as such. (See p. 340.) It should be noted that these depreciation charges do not include the so-called depreciation provisions (sinking funds, etc.) of the Steel Corporation itself. All these provisional depreciation allowances, however, are taken out of costs at this point in order to deduct them from profits later in a single group.[1]

The other operating charges comprise administrative, selling, and general expenses (except that general expenses of transportation companies are included under the ordinary operating expenses), provision for employees' bonus funds (see p. 340), taxes, commercial discounts, and interest. From the total of these operating charges there are deducted the provisional charges for depreciation above referred to. After making this deduction the remaining operating charges are deducted from the gross receipts, leaving a balance of operating earnings (without deducting depreciation), to which are added certain sundry gains (or, in some cases, there are deducted certain losses), and rentals. The addition of these items to the previous balance gives what is termed the " total net manufacturing, producing, and operating income, before deducting provisional charges for depreciation."

To this total operating income is added, in turn, the " other income " of the Corporation, which consists of a small amount of profits from miscellaneous properties owned (but the operations of which are not included in the income account), as well as income from sundry investments, interest on deposits, etc. From the total thus reached there are deducted interest on bonds, mortgages, purchase-money obligations, and special indebtedness of the subsidiary companies, the remainder being the profits of the Steel Corporation, exclusive of depreciation charges. A further adjustment is made at this point to allow for what may conveniently be called " deferred intercompany profits " of subsidiary companies. These, as stated on page 340, are bookkeeping profits on transactions between different constituent companies—as, for instance, the sale of ore to a blast furnace—which have not been actually realized, owing to the fact that the finished material into which such products have gone has not yet been sold to outside interests, but is being carried in inventories. In other words, these are what might be termed " locked-up profits."

It should be noted that the amount of deferred intercompany profits deducted in any year in the profit and loss account of the Steel Corporation is not the total amount of such locked-up profits, but the increase from year to year, since in each year that certain deferred profits are released, new profits in turn are locked up. If the operation were shown in complete detail, there would be given a separate item in the profit and loss account showing as an addition to the earnings the amount of the previously deferred intercompany profits which had been released during the year, and another item showing the amount of such profits locked up or deferred during the year, which would be deducted from the year's earnings. Obviously the same net result is arrived at by deducting simply the increase in the amount of these profits locked up over those realized.

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[1] It may be noted that in the earlier reports of the Corporation these provisional charges for depreciation were not included in the manufacturing and operating cost, but merely the charges for ordinary maintenance and repairs. The change in this respect was made beginning with the annual report for 1908.

The deduction of this item of deferred intercompany profits from the net profits gives what the Corporation terms the "total earnings" of the subsidiary companies. From these "total earnings" are then deducted the above-described "provisional charges for depreciation" (previously taken out of manufacturing and producing cost), namely, payments to bond sinking funds of subsidiary companies and to depreciation and extraordinary replacement funds, the latter including in certain years payments to special funds for depreciation, improvements, and construction.

Deducting these provisional charges for depreciation from the "total earnings" leaves the "net earnings" available for distribution upon the securities of the Steel Corporation or for the general purposes of the company. The first deduction from these so-called net earnings is for the interest on the Steel Corporation's bonds and the provision for the sinking-fund requirements thereon.[1] From the remaining sum are paid the dividends on the preferred and common stock, the balance representing the surplus earnings for the year, out of which, in connection with previously accumulated surplus earnings, the Corporation makes its appropriations for capital expenditures or for writing down its property account, or for miscellaneous purposes.

Section 2. Comparative income account of Steel Corporation, 1901–1910.

Having thus briefly described the general character of the items in the Steel Corporation's profit and loss account and income account, a consolidated statement of these accounts, yearly, from 1901 to 1910, is given in Table 46. For convenience the arrangement has been changed somewhat from that used by the Corporation and just given above, particularly in the condensation of items which, for the present purposes, it is not necessary to show in detail, as, for instance, the inclusion under one head of taxes, commercial discounts, and interest. Furthermore, the restatement of entries for provisional charges for depreciation in the reports as published by the Corporation has been avoided in this consolidated account, these provisional charges being shown but once.

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[1] A minor adjustment is made by the Steel Corporation at this point; it is relatively so insignificant as to require no discussion.

TABLE 46.—COMPARATIVE PROFIT AND LOSS ACCOUNT OF UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES, 1901–1910.

[Figures in italics represent credits.]

	1901 (9 months).	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
Gross sales and earnings	....	$560,510,479.39	$536,572,871.38	$444,405,430.56	$585,331,736.20	$696,756,926.01	$757,014,767.68	$482,307,840.34	$646,382,251.29	$703,961,424.41
Manufacturing and producing cost and operating expenses[1]	....	411,408,818.36	409,268,599.41	353,627,315.31	440,013,432.40	517,083,955.02	564,166,777.12	367,735,102.27	483,417,842.21	529,215,788.12
Balance	....	149,101,661.03	127,304,271.97	90,778,115.25	145,318,303.80	179,672,970.99	192,847,990.56	114,572,738.07	162,964,409.08	174,745,636.29
Administrative, selling, general expenses, and employees' bonus funds[2]	....	13,202,398.89	11,942,916.42	[3] 10,314,681.55	11,996,734.94	14,304,110.45	15,945,436.84	12,932,696.13	15,460,613.78	17,155,807.27
Taxes, commercial discounts and interest, and miscellaneous charges	....	5,032,336.74	4,904,935.89	5,698,712.01	6,573,639.55	8,603,568.66	9,449,942.49	8,068,341.26	12,325,806.51	12,707,247.85
	....	18,234,735.63	16,847,852.31	16,013,393.56	18,570,374.49	22,907,679.11	25,395,379.33	21,001,037.39	27,786,420.29	29,863,055.12
Balance	....	130,866,925.40	110,456,419.66	74,764,721.69	126,747,929.31	156,765,291.88	167,452,611.23	93,571,700.68	135,177,988.79	144,882,581.17
Sundry net manufacturing gains and losses	....	3,128,970.71	1,720,043.58	796,838.08	2,758,633.56	3,790,920.81	3,266,209.45	1,488,805.05	3,385,382.24	2,728,348.14
Other income	....	5,426,451.95	3,548,550.17	2,960,111.24	3,298,500.12	5,368,942.93	6,482,740.97	4,298,079.96	3,432,616.63	3,121,820.65
Total income	....	139,422,348.06	115,725,013.41	78,521,671.01	132,805,062.99	165,925,155.62	177,201,561.65	99,358,585.69	141,995,987.66	150,735,749.96

TABLE 46.—COMPARATIVE PROFIT AND LOSS ACCOUNT OF UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES, 1901-1910—Con.

[Figures in italics represent credits.]

	1901 (9 months).	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
Interest on bonds, mortgages, and purchase-money obligations of subsidiary companies..	....	$6,113,584.34	$6,553,861.06	$6,573,146.54	$6,710,214.73	$6,561,478.70	$6,492,195.42	$7,401,205.18	$7,887,178.18	$7,263,453.66
Deferred profits of subsidiary companies[4]....	....	....	....	....	6,307,189.83	2,739,403.74	9,741,692.51	109,669.94	2,617,395.54	2,417,541.79
	....	6,113,584.34	6,553,861.06	6,573,146.54	13,017,404.56	9,300,882.44	16,233,887.93	7,510,875.12	10,504,573.72	9,680,995.45
Total earnings....	$84,787,596.51	133,308,763.72	109,171,152.35	71,948,524.47	119,787,658.43	156,624,273.18	160,964,673.72	91,847,710.57	131,491,413.94	141,054,754.51
Provisional charges for depreciation, viz:										
Sinking funds on bonds of subsidiary companies.........	536,128.51	624,064.43	1,598,012.48	1,583,116.76	1,689,999.46	1,904,063.50	1,977,761.03	1,588,070.45	1,724,259.65	2,176,041.18
Depreciation and extinguishment funds	2,969,270.66	4,834,710.28	4,599,822.47	3,907,166.55	5,844,981.17	5,857,410.91	6,681,746.03	3,844,214.21	5,884,367.12	....
Extraordinary replacement funds...	6,275,966.45	9,315,614.76	9,297,530.89	8,667,044.36	13,587,909.87	15,395,860.64	15,560,237.38	11,532,896.80	16,109,687.21	[5] 22,140,555.53
Special fund for depreciation, improvements, and construction.......	....	10,000,000.00	[6] 10,000,000.00	....	[7] 2,232,172.00	[7] 7,500,000.00	[7] 3,500,000.00	....	....	....
Total deductions...	9,781,365.62	24,774,389.47	25,495,365.84	14,157,327.67	23,355,062.50	30,657,335.05	27,719,744.44	16,965,181.46	23,718,313.98	24,316,596.71
Net earnings for the year.........	75,006,230.89	108,534,374.25	83,675,786.51	57,791,196.80	96,432,595.93	125,966,938.13	133,244,929.28	74,882,529.11	107,773,099.96	116,738,157.80

Interest on United States Steel Corporation bonds[8]	11,399,999.98	15,187,850.00	19,082,796.38	23,518,292.75	23,697,850.00	23,697,850.00	23,947,850.00	25,197,850.00	25,197,850.00	25,197,850.00
Sinking funds on United States Steel Corporation bonds	1,773,333.33	3,040,000.00	3,797,500.00	4,050,000.00	4,050,000.00	4,050,000.00	4,050,000.00	4,050,000.00	4,050,000.00	4,050,000.00
Total fixed charges	13,173,333.31	18,227,850.00	22,880,296.38	27,568,292.75	27,747,850.00	27,747,850.00	27,997,850.00	29,247,850.00	29,247,850.00	29,247,850.00
Balance	61,832,897.58	90,306,524.25	60,795,490.13	30,222,904.05	68,684,745.93	98,219,088.13	105,247,079.28	45,634,679.11	78,525,249.96	87,490,307.80
Adjustments in sundry accounts	....	....	5,378,837.63	*44,625.14*	99,253.78	90,501.19	681,515.52	*94,034.59*	*548,445.08*	83,122.98
Balance	61,832,897.58	90,306,524.25	55,416,652.50	30,267,529.19	68,585,492.15	98,128,586.94	104,565,563.76	45,728,713.70	79,073,695.04	87,407,184.82
Dividends on preferred stock	26,752,538.75	35,720,177.50	30,404,173.41	25,219,677.00	25,219,677.00	25,219,677.00	25,219,677.00	25,219,677.00	25,219,677.00	25,219,677.00
Dividends on common stock	[9]15,251,531.69	20,332,690.00	12,707,562.50	....	....	10,166,050.00	10,166,050.00	10,166,050.00	20,332,100.00	25,415,125.00
Total dividends	42,004,070.44	56,052,867.50	43,111,735.91	25,219,677.00	25,219,677.00	35,385,727.00	35,385,727.00	35,385,727.00	45,551,777.00	50,634,802.00
Surplus for the year	19,828,827.14	34,253,656.75	12,304,916.59	5,047,852.19	43,365,815.15	62,742,859.94	69,179,836.76	10,342,986.70	33,521,918.04	36,772,382.82
Surplus for the year as above	19,828,827.14	34,253,656.75	12,304,916.59	5,047,852.19	43,365,815.15	62,742,859.94	69,179,836.76	10,342,986.70	33,521,918.04	36,772,382.82
Balance prior surplus	....	19,828,827.14	52,874,597.05	41,096,682.36	27,247,978.92	44,313,794.07	54,556,654.01	69,736,490.77	80,079,477.47	95,401,395.51
	....	54,082,483.89	65,179,513.64	46,144,534.55	70,613,794.07	107,056,654.01	123,736,490.77	80,079,477.47	113,601,395.51	132,173,778.33

TABLE 46.—COMPARATIVE PROFIT AND LOSS ACCOUNT OF UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES, 1901–1910—Con.

[Figures in italics represent credits.]

	1901. (9 months.)	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
Appropriations from surplus for capital expenditures			[10] $17,234,128.58	[10] $8,493,235.58	$26,300,000.00	$50,000,000.00	$54,000,000.00		$15,000,000.00	$25,000,000.00
Reserve to cover possible failure to realize advanced royalties						2,500,000.00		([11])	3,200,000.00	1,000,000.00
Expense in conversion of preferred stock and sale of bonds			6,800,000.00							
Adjustment of surplus		$1,207,886.84	48,702.70	[12] 10,403,320.05						735,059.66
Total		1,207,886.84	24,082,831.28	18,896,555.63	26,300,000.00	52,500,000.00	54,000,000.00		18,200,000.00	26,735,059.66
Balance of surplus as per balance sheet[13]	$19,828,827.14	52,874,597.05	41,096,682.36	27,247,978.92	44,313,794.07	54,556,654.01	69,736,490.77	$80,079,477.47	95,401,395.51	105,438,718.67

[1] Including ordinary repairs and maintenance, but excluding provisional charges for depreciation.

[2] Does not include general expense of transportation companies.

[3] In the 1904 annual report employees' bonus fund is not deducted before determining net earnings. The amount here given includes the fund which makes the treatment consistent with other years.

[4] Profits of subsidiary companies from sales of materials to other subsidiary companies and on hand at the close of the year in the latter's inventories and which the profits have not been realized from the standpoint of a combined statement of the business of the United States Steel Corporation and subsidiary companies. Prior to January 1, 1904, these profits were reported without reference to whether the receiving subsidiaries had converted and shipped the material or whether they carried the material in their inventories

[5] Depreciation and extraordinary replacement funds.

[6] Of this amount $7,667,059.39 was subsequently charged to construction.

[7] Special fund for depreciation and replacement.

[8] Including interest on bonds alive in sinking fund.

[9] Includes $24,901.69 dividends on outstanding stock of subsidiary companies.

[10] Capital expenditures charged to surplus.

[11] During the year this reserve was increased $300,000 and apparently included under the item "Adjustments in sundry accounts."

[12] Of this sum $10,371,803.25 represents a transfer from "Undivided surplus" to "Special surplus," representing profits accrued on sales of material to other subsidiary companies and on hand in latter's inventories.

[13] Exclusive of "Capital surplus" provided in organization and "Special surplus" representing subsidiary companies' intercompany profit in inventories.

Before analyzing this statement of income the general course of the earnings of the Corporation may be noted. On the whole there has been a marked increase in the volume of gross sales and earnings, the total rising from, roughly, $560,500,000 in 1902 to nearly $704,000,000 in 1910; this figure, moreover, was very considerably exceeded in 1907, when the total amounted to $757,000,000.

The "total income" of the Corporation, after deducting the ordinary manufacturing costs, miscellaneous administrative expenses, taxes, and other charges noted in the table, shows a less pronounced change. Thus this total income in 1902 was, roughly, $139,400,000, and but little in excess of $150,700,000 in 1910, an increase of only about 8½ per cent, whereas the gross sales and earnings increased by 25 per cent.

The total net earnings as thus shown by the Corporation's reports, after deducting the provisional charges for depreciation, increased from $108,500,000 in 1902 to over $133,200,000 in 1907; in 1910 they were, roughly, $116,700,000.

The total net earnings, as shown by the Corporation's reports, for the nine and three-fourths years covered by the preceding table amounted to $980,000,000, or an average of almost exactly $100,000,000 per year. The extreme range was from $57,791,197 in 1904 to $133,244,929 in 1907. This comparison well illustrates the pronounced fluctuations which occur in the iron and steel industry. In 1904, which was a year of marked depression, the earnings of the Corporation exceeded its fixed charges and preferred-stock dividend by only about $5,000,000, while in 1907 the excess over these requirements was more than $79,000,000.

Section 3. Revision of income account of Steel Corporation.

If all the items in the Steel Corporation's income account could be accepted for the present purpose without change, then all that would be necessary in order to determine the rate of return on the investment actually employed in the business would be to compare the "net earnings," as given in the preceding table, with the investment as established by the Bureau in Table 43.

Most of the items in the income account can thus be accepted without criticism or change. However, for the purpose of computing the real rate of profit upon the actual investment certain rearrangements and revisions of this income account are necessary. These are shown in Table 47, on page 341. In the first place, the deduction of interest on bonds, mortgages, purchase-money obligations, and similar indebtedness of the subsidiary companies should not be made in computing the rate of return on the investment, because such obligations have been regarded as representing an equivalent addition to the investment and have not been treated as current liabilities. Obviously, since such amounts have been retained in the investment, the amounts paid out from earnings as interest on such indebtedness should be retained in the statement of earnings.[1]

It might be argued, moreover, that such expenditures as the provision for employees' bonus funds should not be deducted from the earnings, but that these provisions should be regarded as in somewhat the same class as dividends paid to stockholders, on the ground that the establishment of these bonus funds is a profit-sharing arrangement. Since, however, the opportunity for sharing in such bonus payments might be regarded as in the nature of additional wages, the deduction as made by the company has been allowed to stand.

A further revision of the earnings is, however, necessary in the case of the provisional charges for depreciation. It will be seen that the Corporation deducts from earnings under this head provisions for sinking funds on bonds of subsidiary companies, and amounts charged to the depreciation and extinguishment funds, to the extraordinary replacement funds, and to special funds for depreciation, improvements, and construction. As already pointed out in Chapter VI, there is no necessary relationship between bond sinking fund provisions and true depreciation, but for convenience the bulk of the amount set aside for sinking funds on bonds of subsidiary companies may be regarded as the equivalent of depreciation. As shown in Chapter VI, however, the various provisional appropriations for depreciation were in excess of necessary allowances, the total excess for the entire period from April 1, 1901, to December 31, 1910, having been computed at $38,285,000. In order to arrive at a correct statement of the earnings, therefore, this excessive amount has been restored by the Bureau.

The item of adjustments in sundry accounts, which in the income statements of the Steel Corporation is made after deducting the interest and sinking-fund provisions from the net earnings, should in this revision be taken account of before establishing the readjusted earnings.

The Bureau has, moreover, restored to the earnings the item of deferred intercompany profits in inventories. It is proper that the Corporation should deduct this from its income in arriving at the net earnings, since these deferred profits have not actually been realized by the sale of the products in question to outside interests. However, such locked-up inventory profits are only tentatively deducted by the Corporation, and in the balance sheet they appear as a suspended surplus, thus indicating an expectation on the part of the

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[1] It will be noted that interest on the Steel Corporation's bonds is not deducted by the Corporation until after the net earnings are established.

Corporation that they will eventually be realized. While, therefore, the deduction of this item is easily justified, on the other hand the Bureau has deemed it proper, and on the whole better, to restore this item to the earnings in computing the rate of return on the actual investment. As already pointed out, the amount of such profits restored in any given year is the increase over the amount "locked up" in the previous year's inventories, and not the entire amount of such profits.

The revisions thus described are carried out in the following table, in which there are added to the net earnings for the year, as given in Table 46, the amounts deducted in that table for interest on bonds, mortgages, purchase money and other similar obligations of subsidiary companies, the increase in the item of deferred intercompany profits, the excess of provisional depreciation charges over what were determined to be proper and necessary provisions, the item of "adjustments in sundry accounts" also being taken into consideration.

TABLE 47.—ACTUAL EARNINGS OF STEEL CORPORATION ON ITS TOTAL INVESTMENT AS COMPUTED BY BUREAU, 1901-1910.

Year.	Net earnings, as shown by annual reports.	Adjustments by Corporation in sundry accounts.	Amounts restored to earnings by Bureau.			Total adjusted earnings.
			Interest on bonds, mortgages, and purchase-money obligations of subsidiary companies.	Locked-up intercompany profits in inventories.	Excessive depreciation allowances.	
1901 [1]	$75,006,230.89		[2]$4,500,000.00	(3)	−$1,765,000.00	$77,741,230.89
1902	108,534,374.25	−$1,207,886.84	6,113,584.34	(3)	8,062,272.00	121,502,343.75
1903	83,675,786.51	− 5,427,540.33	6,553,861.06	(3)	9,354,851.00	94,156,958.24
1904	[4]57,791,196.80	+ [4]13,108.34	6,573,146.54	−$1,254,336.48	− 631,165.00	62.491,950.20
1905	96,432,595.93	− 99,253.78	6,710,214.73	6,307,189.83	3,480,088.00	112,830,834.71
1906	125,966,938.13	− 90,501.19	6,561,478.70	2,739,403.74	8.216,388.00	143,393,707.38
1907	133,244,929.28	− 681,515.52	6,492,195.42	9,744,692.51	6,616,572.00	155,416,873.69
1908	74.882,529.11	+ 394,034.59	7,401,205.18	426,983.85	1,688,543.00	84,793,295.73
1909	107,773,099.96	+ 548,445.08	7,887,178.18	2,617,395.54	1,981,460.00	120,807,578.76
1910	116,738,157.80	− 818,182.64	7,263,453.66	2,751,307.08	1,281,348.00	127,216,083.90
Total.	980,045,838.66	− 7,369,292.29	66,056,317.81	23,332,636.07	38,285,357.00	1,100,350,857.25

[1] Nine months.

[2] Approximated; this amount never computed by the Corporation.

[3] In these years the intercompany profits in inventories were not deducted by the Corporation and hence need not be restored.

[4] After deducting employees' bonus fund, which in this year was taken out after stating net earnings, but which in other years is deducted before determining the net earnings.

The result of these revisions, it will be seen, is an addition of $120,305,019 to the net earnings as given in the published reports, making a total of $1,100,350,857.

Section 4. Comparison of revised earnings of Steel Corporation with revised investment.

The earnings of the Steel Corporation, as thus adjusted by the Bureau, may now be compared with the investment as correspondingly revised. Such comparison is given in Table 48. It will be recalled that the Bureau's figures of investment as here given are for tangible property alone:

TABLE 48.—COMPARISON OF INVESTMENT OF STEEL CORPORATION, WITH TOTAL EARNINGS THEREON, AS ADJUSTED BY BUREAU, YEARLY, 1901–1910.

Year ended Dec. 31—	Total investment in tangible property as computed by Bureau.	Earnings as adjusted by Bureau.	
		Amount.	Per cent.
1901[1]	$698,869,756	[1]$77,741,231	[2]14.8
1902	763,574,919	121,502,344	15.9
1903	806,615,979	94,156,958	11.7
1904	818,238,143	62,491,950	7.6
1905	874,840,920	112,830,835	12.9
1906	947,397,884	143,393,707	15.1
1907	1,078,763,602	155,416,873	14.4
1908	1,090,425,487	84,793,296	7.8
1909	1,146,875,993	120,807,579	10.5
1910	1,186,982,038	127,216,084	10.7
Total		1,100,350,857	
Average	941,258,472	[3]112,856,498	12.0

[1] Nine months, April to December; investment includes additions during this period.
[2] Indicated rate per annum based on actual earnings for nine months.
[3] Average yearly profits for nine and three-fourths years.

The table shows an average rate of return upon the total investment in tangible property for the entire period from April 1, 1901, to December 31, 1910, of 12 per cent. The highest rate was reached in 1902, namely, 15.9 per cent, and in 1906, an unusually prosperous year, it exceeded 15 per cent. In 1904 and 1908, however, which were years of pronounced reaction, the rates fell to 7.6 per cent and 7.8 per cent, respectively. Prior to the formation of the Steel Corporation and other large consolidations, the iron and steel industry was noted for violent changes in the rate of profit, the industry, indeed, having been aptly termed "either prince or pauper." This table shows that so far as the Steel Corporation is concerned the business, although still subject to marked fluctuations in profits, has, even in the most depressed years of this period, shown a substantial return on the actual investment.

The average rate for the first four and three-fourths years was 12.5 per cent, as against 11.6 per cent in the five years from 1906 to 1910. Therefore, in so far as any tendency may be noted, it is toward a lower rate of profit in recent years.

It is important to emphasize at this point that the rate of earnings of a great concern which, like the Steel Corporation, handles more than 50 per cent of the business of the country is not to be judged by the same standard as the rate for a comparatively small concern. Some of the most successful concerns in the steel industry outside of the Steel Corporation show higher rates of return upon their total investments. While, however, some exceptionally efficient or fortunate concerns earn rates in excess of this average, on the other hand a great many companies show very much lower rates on their total investments, while sometimes the business is conducted at a loss. Therefore, an average rate of 12 per cent on the total tangible investment for over one-half of the entire steel business of the country is much more significant than the same rate or even a larger rate for a comparatively small concern. It probably means that the return on a considerable proportion of the business of the country, which under more competitive conditions and more scattered ownership would be conducted at a lower rate of profit, has been considerably increased.

It may also be noted that the investment includes a large amount of idle property, particularly unimproved ore reserves, which, of course, tends to reduce the rate, although the investment in such undeveloped iron-ore property as computed by the Bureau is not so great as to very materially affect the rate of profit. It is, however, worth emphasizing that the rate of profit here given includes not only the iron and steel industry proper, but also the iron-ore mining industry. Prior to the era of consolidation the latter, to a large extent, was distinct from the manufacture of iron and steel, and under the scattered ownership of iron-mining properties then prevailing profits generally are understood to have been comparatively low, on the average. Under present conditions in the iron and steel industry, however, the Lake iron-ore industry is one of the most profitable branches of the business. This factor should be considered, therefore, in comparing the profits of the iron and steel industry at the present time with those obtained under the different conditions formerly prevailing.

The average rate of 12 per cent here given is, as repeatedly pointed out, the rate upon the entire investment in the tangible property. It is, of course, considerably larger than the rate of net profit upon the total issue of capital securities, because this total capitalization greatly exceeds the investment as established by the Bureau. The average capitalization of the Corporation for the entire period (based on the amounts outstanding at the close of each year) was approximately $1,445,000,000. Using the earnings as revised by the Bureau, the average rate on this average capitalization would be 7.8 per cent.

The capital securities of the Steel Corporation, however, include a large amount of bonds upon which the return is fixed, in most cases at 5 per cent. If the bonds of the Corporation had been issued only for an equal amount of property or cash in every instance, an amount equal to the total bonded indebtedness (including purchase-money obligations and mortgages) could be deducted from the investment as computed by the Bureau, leaving what may be termed as the investment contributed by the stockholders or represented by the capital stock. If the earnings after deducting interest on the bonded debt were compared with such remaining portion of the total investment, the rate would be considerably in excess of 12 per cent. Such a comparison can not, however, be presented in a satisfactory way, particularly because the bond issues did not always represent an equivalent addition to the investment. In the case of the acquisition of the Carnegie Company in particular, over $300,000,000 in bonds were issued for Mr. Carnegie's interest alone, whereas the total tangible assets of the Carnegie Company a year earlier apparently were not much, if any, in excess of $160,000,000. (See p. 159.) Therefore, to deduct the total indebtedness from the true investment would leave an unduly low remainder for the capital stock and unfairly exaggerate the rate of profit on that part of the true investment which may be considered as contributed by the stockholders.

Consequently the Bureau does not attempt to give in definite figures the rate of profit earned by the Steel Corporation on the true investment represented by its capital stock, but merely calls attention to the fact that the rate of profit above shown is not the rate earned on that part of the true investment which may be considered as contributed by the stockholders, but a lower rate earned on the total true investment and accruing to the stockholders and bondholders combined.

Section 5. Portion of Steel Corporation's earnings accruing to the benefit of the stockholders.

The preceding comparison of earnings with the actual investment affords what is perhaps the best single available test of the earning power of the Corporation and of the reasonableness of its profits. As already shown, a comparison of the earnings with the total capitalization would mean little, because, particularly in earlier years, the capitalization was far in excess of the actual investment, and still is materially in excess of that investment. It is, however, of decided interest to analyze the disposition of the earnings of the Corporation from the standpoint of the stockholders and with especial reference to the position of the common stock. Such an analysis shows that whereas at the outset the common stock represented no real value whatever it has nevertheless received a substantial return in dividends. Moreover, there has been built up by the great increase in investment a considerable equity for the common stock.

Of course most of this equity is not in a form in which it can be distributed as dividends, because most of the earnings accruing to the benefit of the common stock have been reinvested in fixed property, either new plants, or new ore, coal, and similar properties. Nevertheless, the reinvestment of these earnings means that an equity for the common-stock holders in the property has been created, and that meanwhile a great investment is being utilized to produce profits of which only fixed amounts are distributed to the holders of bonds and preferred stock, while the remaining amounts may be applied to dividends on the common stock.

In computing the amount of the earnings accruing to the benefit of the common-stock holders, the Bureau has included the amounts set aside by the Steel Corporation itself for sinking-fund requirements. While these amounts obviously will not accrue directly to the stockholders in a form available for dividends, because the bond indentures require absolutely that such sinking-fund payments shall be made, yet they represent an addition to the equity back of the stock as truly as the earnings reinvested in fixed property. In the one case, the addition to the equity is direct, through the construction of additional plants or the addition of more physical property. In the other case it is indirect, by reducing the indebtedness against the property. Therefore, the earnings accruing to the benefit of the stockholders have been regarded as the entire earnings, as revised in Table 47, less only interest on the bonds and similar indebtedness of the Steel Corporation and of its subsidiaries.

The total amount of earnings accruing to the benefit of the stockholders for the entire period from 1901 to 1910, as thus determined, is $816,430,854, of which amount $393,951,787 was actually paid out in dividends, as follows:

TABLE 49. AMOUNT OF EARNINGS OF STEEL CORPORATION, 1901–1910, WHICH DIRECTLY OR INDIRECTLY HAVE INCREASED THE EQUITY OF THE STOCKHOLDERS IN THE PROPERTY.

Total earnings, as revised by the Bureau		$1,100,350,857
Deduct—		
Interest on bonds, etc., of subsidiary companies	$66,056,318	
Interest on United States Steel bonds (less interest on bonds in sinking funds)	211,063,685	
Commission to bankers under bond-conversion plan	6,800,000	
Total		283,920,003
Balance accruing to benefit of stockholders		816,430,854
Amount actually paid out in dividends:		
Preferred stock	[1] 269,439,530	
Common stock	124,512,257	
		393,951,787
Amount reinvested in fixed property and other assets, or applied to sinking funds on United States Steel bonds, and accruing to benefit of stockholders		422,479,067

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[1] Including $24,902 paid out on stocks of subsidiary companies in 1901.

The total of the amounts reinvested in the property and the amounts applied to sinking funds on bonds of the Steel Corporation, namely, $422,479,067, which represents an equity accruing to the benefit of the stockholders, does not include $20,092,728 of sundry reserve funds on the books on December 31, 1910. Of this figure, $8,402,999 represented insurance funds, and the balance, $11,689,729, contingent and miscellaneous operating funds. So far as the insurance funds are concerned, these under certain conditions (i. e., the dissolution of the Corporation) might fairly be considered as an addition to the equity built up in the interest of the stockholders. In the case of the contingent and miscellaneous funds, however, it might be incorrect to treat them in the same manner. Adding the insurance funds to the above figure would give a total equity of rather more than $430,000,000.

In other words, the capital stock of the Corporation, over $720,000,000 of which at the organization of the Corporation (see p. 239) represented no tangible value whatever, and much of which was mere "water," has received during the period from April 1, 1901, to December 31, 1910, nearly $400,000,000 in cash dividends, while, in addition, $422,479,000 more of the earnings of the Corporation (this excluding the sundry funds above referred to) went directly or indirectly to enhance the equity accruing to the holders of the stock.[1]

Had the preferred stock originally been fully covered by tangible property value this entire equity thus built up might be considered as accruing to the benefit of the common-stock holders. Since, however, as shown on page 240, a considerable portion of the preferred stock in 1901 had no tangible property back of it, to this extent this increase in the equity can not be considered as belonging to the common-stock holders.

Opinions as to whether the dividends paid out to the common-stock holders, together with the equity built up for them in the property of the Corporation, were excessive or not must depend finally upon opinions respecting the reasonableness of the average profit of 12 per cent on the total investment as computed above. If that rate be accepted as reasonable and proper for a concern like the United States Steel Corporation, then the distribution of this amount among the various classes of security holders is a subordinate consideration, particularly as the voting power is not restricted to any small or selected group of security holders, who thereby might exploit the earnings to their own advantage. If, on the other hand, the average rate of 12 per cent on the total investment be regarded as unreasonably high, then the large equity built up in the interest of the stockholders must, to some extent at least, be regarded as representing an undue exaction from the consuming public.

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[1] In 1903, $150,000,000 preferred stock was exchanged into a like amount of bonds; this, however, does not affect this discussion.

In judging of the reasonableness of this rate of 12 per cent profit on total investment, all the circumstances of the case should be considered, and in particular the following: (1) That the Corporation was not one of a number of nearly equal competitors, but rather one which controlled a very large proportion of the total business of the country, and one which possessed in addition certain quasi monopolistic features, both of which circumstances tended to reduce risk; (2) that, as in all great companies of this type, the stockholders as a class had no real responsibilities of management, while the broad market for the stock enabled them to invest therein or sell out their holdings at current market values without difficulty; and (3) that when the profit on that part of the actual investment which was put in for shares of the capital stock (as distinguished from bonds) is considered it was at a considerably higher rate than 12 per cent. (See p. 344.)

CHAPTER VIII.

THE BOND-CONVERSION PLAN OF 1902–3.

Section 1. Description of plan and terms.

In April, 1902, or just about a year after the organization of the United States Steel Corporation, announcement was made that the board of directors had approved plans for converting $200,000,000 of the 7 per cent preferred stock of the company into 5 per cent bonds. As a part of this conversion plan it was also proposed to sell $50,000,000 of bonds to reimburse the treasury for expenditures previously made to retire certain current obligations, and to secure additional working capital for the Corporation.

The terms of the plan were in substance as follows: An issue of $250,000,000 five per cent 10–60 year sinking-fund gold bonds was to be authorized. Of this amount, $200,000,000 was to be paid for in preferred stock exchangeable at par, the additional $50,000,000 to be sold for cash, also at par. Each holder of preferred stock was to have the right to subscribe for the new bonds to the extent of one-half his holdings of that stock (there being outstanding, roughly, $500,000,000 of preferred stock, or twice the amount of the bond issue proposed). These subscriptions were to be payable as follows: 80 per cent in preferred stock and 20 per cent in cash; that is to say, a holder of 100 shares of preferred stock of a par value of $10,000 could subscribe for $5,000 of the new bonds at par and pay for them by depositing 40 shares of his preferred stock, of a par value of $4,000, and $1,000 in cash. The stockholders also had the option of exchanging such 40 per cent of their holdings of preferred stock without subscribing for any of the new bonds in cash. A syndicate was, however, formed, under the management of J. P. Morgan & Co., to underwrite the sale of $20,000,000 of bonds for cash at par and to guarantee the exchange of $80,000,000 of preferred stock. A copy of the syndicate agreement appears elsewhere. (See p. 400.) This did not mean that the syndicate was compelled to surrender $80,000,000 of stock or to subscribe $20,000,000 of cash, in addition to subscriptions by other stockholders. It simply guaranteed that in all $80,000,000 of preferred stock would be deposited and that $20,000,000 of bonds would be paid for in cash. To the extent that stockholders outside of the syndicate made such deposits, the syndicate's obligation was reduced.

It will be seen, therefore, that the plan did not really insure the raising of more than $20,000,000 of the $50,000,000 cash capital which, according to the official announcement, was urgently needed.

An important feature of the arrangement, and one which proved productive of intense dissatisfaction, was a provision that the underwriting syndicate should receive a commission of 4 per cent on all bonds issued, whether for cash or in exchange for preferred stock, and, furthermore, regardless of whether such bonds were exchanged by members of the syndicate or by individual stockholders of the Corporation. Of this 4 per cent commission 20 per cent, or one-fifth, was to be retained by J. P. Morgan & Co., syndicate managers. (See sec. 3.)

The plan was submitted to the stockholders of the Corporation at a meeting held on May 19, 1902, and was approved by an overwhelming majority of the stock represented.[1]

Several suits were, however, immediately instituted to prevent the execution of this plan. Eventually all of this litigation was swept aside, but it forced a postponement of the plan for about a year. On March 3, 1903, J. P. Morgan & Co., acting on behalf of the Steel Corporation, renewed the offer of exchange on the terms above outlined, with the necessary changes in dates.

Section 2. Extent of conversion operations.

At the time the conversion plan was first announced, in April, 1902, the syndicate members deposited with the syndicate managers $80,000,000 preferred stock, and it appears that this stock was allowed to remain in the hands of the syndicate managers during the time the plan was delayed by litigation. There were deposited by stockholders outside of the syndicate, either at the time the plan was originally announced or under the offer as renewed a year later, $45,200,000 of preferred stock.[2] There were no cash subscriptions to new bonds on the part of individual stockholders outside of the syndicate (except for the trifling amount of $12,200), since the bonds

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[1] The vote was as follows:

	Shares.
Preferred stock:	
In favor	3,750,596
Opposed	4,865
Common stock:	
In favor	3,966,232
Opposed	7,675

The great bulk of the vote in favor was by proxy. Excluding proxies obtained by the directors, the vote was as follows:

	Shares.
Preferred stock:	
In favor	2,818
Opposed	4,865
Common stock:	
In favor	1,905
Opposed	7,675

[2] Annual report of the Steel Corporation for 1903.

at the outset sold (on a "when-issued" basis) slightly under par and were selling by March, 1903, when the plan was formally put in operation, at only 88. The preferred stock was selling in April, 1902, when the plan was first announced, at 94; by the time the offer was renewed the price had dropped to about 85.

Under the offer as renewed, the right to exchange preferred stock for bonds, so far as shareholders outside of the syndicate were concerned, was to cease on May 16, 1903. The underwriting syndicate, however, could make such exchange until July 1, 1904; in other words, for a period of 13½ months after this privilege was terminated with respect to the stockholders outside the syndicate. It is true that the individual stockholders had been given for a limited period a preferential opportunity to exchange their preferred stock for bonds. That is to say, had every holder of preferred stock outside of the syndicate elected to exchange 40 per cent of his preferred stock for bonds, then the syndicate would have been able to exchange only a part (about 40 per cent) of the $80,000,000 which it had deposited with J. P. Morgan & Co. As just shown, however, only about $15,200,000 of preferred stock was deposited by the shareholders outside the syndicate up to May 16, 1903, when the privilege was terminated so far as these stockholders were concerned. On the other hand, the syndicate, under its arrangement, was to be allowed to continue such exchanges up to July 1, 1904.

The exclusive extension of this privilege to the underwriting syndicate for this period resulted in intense dissatisfaction. This was greatly aggravated because the margin between the price of the bonds and the price of the preferred stock continued to widen, so that the syndicate was able to make a large profit by buying the preferred stock in the market and immediately turning it into bonds worth a higher price. (As shown elsewhere, the profit on this operation may have been more than offset by a loss on the syndicate's cash subscription to $20,000,000 bonds.) In October, 1903, the margin between the price of the bonds and the price of the preferred stock was about 12 points. In November it widened out to 15 points, the preferred stock selling below 50, whereas the lowest price for the bonds was 65.[1] This meant that the syndicate, which had the exclusive right to continue the conversion, could, by buying preferred stock in the open market and immediately exchanging it for the new bonds, make a profit of $12 to $15 on every share thus purchased and exchanged. The total amount of the stock purchased by the syndicate appears to have been about 248,000 shares. (See p. 355.)

The fact that the privilege of such exchange was confined to the underwriting syndicate, as well as other features of the plan, aroused widespread disapproval. As a result, on November 19, 1903, the arrangement was abruptly terminated.

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[1] Still later there was a further widening of the margin, due to an advance in the bonds, but the arrangement was abandoned soon after this. (See p. 356.)

Section 3. Results of conversion plan.

RESULTS TO THE CORPORATION.—The conversion plan, it will be recalled, purported to provide for the exchange of $200,000,000 of 7 per cent preferred stock into a like amount of 5 per cent bonds, thereby substituting an interest charge of $10,000,000 for dividend requirements of $14,000,000, and also for the sale of $50,000,000 of bonds to provide cash, which was apparently much needed, thereby increasing the interest charges by $2,500,000. One result of this plan, therefore, had it been carried out in its entirety, would have been the substitution of $12,500,000 of interest for $14,000,000 of dividends, or a net saving to the Corporation of $1,500,000. On the conversion alone the saving would have been $4,000,000.[1] As already seen, however, this object was by no means realized. The total amount of bonds issued under this conversion plan was stated by Chairman Gary, at the time the syndicate agreement was terminated, as follows:

$146, 388, 500	bonds have already been issued in exchange for stock received and canceled.
3, 611, 500	remain to be issued in exchange for preferred stock to be converted by the syndicate.
2, 902, 000	bonds sold at par for cash and paid for in full October 1 and already issued.
17, 098, 000	bonds sold at par for cash upon which 25 per cent was paid to the Corporation October 1 and which will be issued whenever the remaining 75 per cent shall be called for and paid.
170, 000, 000	total issue outstanding.

The arrangement was further described in the second annual report of the Corporation as follows:

> Up to December 31, 1903, there had been issued and were outstanding United States Steel Corporation 10–60 year 5 per cent sinking fund gold bonds, dated April 1, 1903, for the aggregate principal sum of $152,902,500. These bonds were issued in payment for 1,500,000 shares of preferred stock at par, as well as in consideration of $7,177,100 cash received from J. P. Morgan & Co., for a syndicate, being part of $20,000,000 cash receivable under the contract of April 1, 1902, approved by the stockholders in special meeting May 19, 1902, and thereafter sustained by the courts. Since January 1, 1904, and up to the date of the writing of this report, there have been received from J. P. Morgan & Co. $3,822,900 additional on account of the aggregate of $20,000,000 cash receivable as above, and there have been issued additional bonds of the par value of $5,097,500, making at this date (March 1, 1904) a total issue of bonds for the aggregate principal sum of

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[1] This does not take account of the necessity of an annual sinking fund provision, nor of the 4 per cent commission to the syndicate.

> $158,000,000. Thus the Corporation has received from J. P. Morgan & Co. for the syndicate $11,000,000 in cash and has delivered $8,000,000 in bonds, leaving $9,000,000 cash to be received and $12,000,000 bonds to be delivered.
>
> The Corporation has the right at its option at any time to call for the remaining $9,000,000 cash, but in order to avoid the unnecessary burden of interest upon bonds issued for money not immediately needed, arrangements have been made with J. P. Morgan & Co. whereby, until otherwise provided, the Corporation will not be required to call the remaining $9,000,000 cash or to deliver bonds therefor except when and as the cash shall be needed by the Corporation. Interest on these bonds begins to run only as and when the Corporation receives cash for them. Under Article Third of the contract, Messrs. J. P. Morgan & Co., representing the syndicate, have received, or will receive, as compensation 4 per cent upon the par of $170,000,000 bonds, for which there have been sold to and received by the Corporation 1,500,000 shares of preferred stock at par, besides the $20,000,000 in cash received or receivable as above stated.

It will be seen, therefore, that the plan fell far short of accomplishing what it was designed to accomplish. Instead of providing $50,000,000 new cash (or, after deducting the syndicate's commission of 4 per cent, a net amount of $40,000,000) the total new cash raised was only $13,200,000, this amount being arrived at by deducting from the $20,000,000 cash subscribed by the syndicate the 4 per cent commission on the total of $170,000,000 of new bonds issued, or $6,800,000. Moreover, only a portion of this cash had been paid in to the Corporation at the end of December, 1903, whereas, according to the circular announcing the conversion plan in April, 1902, $50,000,000 of cash was desired in the immediate future. The annual dividend requirements of the Corporation had been reduced by $10,500,000 through the exchange of the $150,000,000 of 7 per cent preferred stock for the 5 per cent bonds, but interest charges had been increased $8,500,000 by reason of the issuance of a corresponding amount of 5 per cent bonds plus $20,000,000 additional bonds sold for cash. There was, therefore, a net reduction in the combined charges of $2,000,000 per annum. This reduction, however, had been accomplished only by substituting a bonded debt for a stock liability, and at an initial cash expenditure of $6,800,000 for commissions.

Results to the syndicate.—The results of the bond-conversion plan to the underwriting syndicate can only be estimated, since it is not known what the stock deposited by syndicate members cost them, or what profit was made on the purchase of preferred stock in the open market by the syndicate for exchange into bonds.

It will be recalled that the syndicate originally deposited $80,000,000 of preferred stock and the outside stockholders $45,200,000, leaving $24,800,000 to be purchased in the open market by the syndicate (the total amount of preferred stock exchanged being $150,000,000).

The preferred stock, at the time it was originally deposited by the syndicate members, was worth, as already stated, about 94. The 5 per cent bonds, at the time the syndicate was finally wound up in May, 1904, were quoted at about 73. On this basis alone (which is not wholly conclusive), there was a loss of 21 points on each share of preferred stock exchanged by the syndicate, or $16,800,000 in all. Against this, however, must be placed the syndicate's commission of $6,800,000, and the profits which it made on the purchase of preferred stock in the open market for exchange into bonds; deductions would then have to be made for certain expenses of the syndicate. The amount of the profit made on such purchases of preferred stock in the open market is not definitely known. Just before the conversion arrangement was terminated, in the latter part of November, 1903, there was a possible profit of nearly 15 points on such conversion operations. As shown later, very heavy purchases of the preferred stock were made in the open market at just about this time, and it is reasonable to assume that a considerable part of such purchases were for the account of the syndicate, because of the large profit possible on such operations. An allowance of $15 per share as the average profit on such open-market conversion operations would, however, probably be too high. Assuming that the profit may have averaged as much as $10 per share for the preferred stock exchanged, the syndicate's profit on this part of the transaction would have been, roughly, $2,500,000, in addition to which there would have been some interest receipts; but, on the other hand, there would have to be deducted the expenses of the syndicate. Assuming that the net profit on the preferred stock purchased for exchange into bonds was only $2,000,000, the indicated loss of $16,800,000 above referred to would have been reduced, after also taking account of the $6,800,000 commission, to $8,000,000. It may be noted that some estimates of the syndicate's loss published in financial journals about this time ranged in the neighborhood of this figure.

It is, of course, somewhat arbitrary to calculate the results to the syndicate on the basis of the value of the bonds on the day the syndicate agreement was terminated. Some of the bonds had been delivered to syndicate members prior to that date, while the value of those received at that time might perhaps be better expressed by taking the average market price over a considerable period of time. Thus the average price of these bonds during the remainder of the calendar year 1904 was approximately 81, or 8 points above the price used in the foregoing calculation. If the bonds had been disposed of at such an average figure, the indicated loss would of course, be correspondingly reduced.

Any calculations of the results to the syndicate, however, are necessarily somewhat inconclusive. The conversion operations were accompanied by pronounced depression in the steel industry and there can be little doubt that the preferred stock would have declined heavily even had the conversion plan never been undertaken. Viewed from this standpoint, it might be argued that the syndicate members (and individual stockholders as well), in proportion as they exchanged preferred stock for a bond worth from 10 to 15 points more, reduced a loss which they might otherwise have suffered. On the other hand, in recent years the preferred stock of the Steel Corporation has sold well above these bonds (both issues, moreover, having sold for a long time well above par), so that viewed from this point it might be argued that the stockholders and syndicate members who exchanged their preferred stock had lost a possible profit in this operation. Against any sacrifice of future profit which might have been made by retaining the 7 per cent preferred stock, however, those who exchanged that issue at all times enjoyed the advantages afforded by a security which preceded that issue, while, moreover, the bonds for a considerable time sold at higher prices than the preferred stock.

Section 4. General criticism of the conversion plan.

While the courts of final resort decided every suit brought against the conversion plan in favor of the United States Steel Corporation, their decisions really had almost nothing to do with the merits of the plan itself. The courts passed almost exclusively on the legal rights of the Corporation. On the question of the propriety of the plan the courts simply held that, in the absence of fraud, they could not go back of the action of the directors of the Corporation. They held that there was no evidence of fraud. This, however, is aside from the question of the advisability or wisdom of the plan.

The wisdom of substituting a bond issue for a portion of the preferred stock may be left to individual opinion. The question whether the company should have postponed the payment of dividends on the common stock and thus have avoided issuing bonds for cash may likewise be passed over at this late day, and particularly since these are matters which concern the stockholders rather than the general public. Some features of the plan, however, are of general interest both as bearing upon the organization and financing of corporations, and also because they had a direct bearing through the stock market on the security market in general, and thus tended directly to affect the general public. Particular mention may be made of the arrangement with the underwriting syndicate and its compensation. It will be recalled that whereas the holders of the preferred stock outside the syndicate were permitted to deposit preferred stock in exchange for bonds only during the period from March 16 to May 16, 1903, the syndicate was, under the terms of the contract, as renewed, permitted to make such exchange up to July 1, 1904. After the offer had been terminated with respect to the shareholders outside the syndicate, in view of the fact that such shareholders took advantage of the offer only to a limited extent, the decline in the market price of the preferred stock worked to the advantage of the syndicate, since it could buy that stock and convert it into bonds at a higher price. While the bonds themselves declined greatly in value the preferred stock fell so much faster that there was a large profit for the syndicate (with respect to this part of the arrangement) in thus purchasing preferred stock and exchanging it into bonds. As already shown, when the plan was first announced, in April, 1902, the new bonds were quoted at only a fraction under par, and the preferred stock at 94. By the time the plan was actually put in operation, in March, 1903, the preferred stock had dropped to about 86. The bonds, however, had fallen to about 87, so that there was only a small margin between them. The relationship of the two prices was substantially maintained up to May 16, 1903, when the subscription privilege of preferred stockholders outside the syndicate was terminated, both the stock and the bonds being quoted on that date at about 83. By July 1, however, the stock had fallen to 81, the bonds remaining unchanged at about 83, thus showing a difference of about 2 points. By the first of October this margin had increased to about 10 points, and by the end of the month to over 12 points, while by the middle of November, or just before the contract with the syndicate was terminated, it had widened out to about 15 points. During the entire interval from May 16, 1903, to November 19, 1903, on which date the arrangement was terminated, the syndicate had the exclusive right of conversion. Obviously there was a heavy profit in thus purchasing preferred stock at from 10 to 15 points below the price of the bonds and making the conversion. It has already been shown that the syndicate apparently purchased something like 248,000 shares of preferred stock in addition to the amount originally deposited by it. Apparently the great bulk of this stock was purchased during the interval when the margin between the price of the bonds and the price of the stock was abnormally wide. Very convincing evidence to this effect is furnished by the fact that on October 22, 1903, the United States Steel Corporation, in making application to the New York Stock Exchange to have these bonds listed on the exchange, stated that there had been issued up to that time $133,295,500 of the new bonds, of which amount $130,411,000 had been issued in exchange for preferred stock to be retired (the balance having been sold for cash to the syndicate). As above shown, when the syndicate agreement was terminated by the Corporation, the amount of preferred stock exchanged or which could be exchanged was $150,000,000. Therefore, the evidence is very strong that during this interval between October 22, 1903, and November 19, 1903, approximately

$20,000,000 worth of preferred stock, or 200,000 shares, were purchased in the open market by the syndicate for exchange. During this interval there were very heavy transactions in the preferred stock, the total for the four weeks ended October 19 exceeding 2,000,000 shares, while the margin between the preferred stock and the bonds ranged generally from 12 to 15 points, occasionally being somewhat greater.

As already stated the privilege of the syndicate to make such conversion operations was terminated on November 19, 1903. The following statement was given out by E. H. Gary, chairman of the Corporation:

> At a meeting of the finance committee of the United States Steel Corporation held yesterday it was (by unanimous vote) decided to suggest to Messrs. J. P. Morgan & Co. that the syndicate contract for the conversion of preferred stock into second-mortgage 5 per cent bonds should be canceled and terminated beyond the amount of $150,000,000, which figure has very nearly been reached.
>
> Messrs. J. P. Morgan & Co. immediately acceded to the request of the finance committee and no further exchanges will be made for account of the syndicate beyond the amount stated.

It was reported that this sudden termination of the agreement was prompted by the threat of injunction proceedings against the Corporation. However that may have been, the vigorous condemnation of the plan by the press was involving the Corporation in exceedingly unpleasant notoriety, and there can be little doubt that the abandonment of the arrangement was in response to this disapproval. (See pp. 350–351.)

While the evidence, therefore, indicates that the syndicate purchased a very large quantity of preferred stock during the period when it was selling at a wide margin under the price of the bonds, this in itself does not show that the syndicate was directly responsible for the pronounced depression of the stock. Such charges would, of course, be almost impossible of proof. It is, however, worth noting that the suspicion was very widely entertained in Wall Street at the time that the syndicate was not merely taking advantage of a pronounced decline in the preferred stock, but that it had actively assisted in bringing about this decline. The mere fact that there was a special inducement to indulge in such manipulation and that the syndicate would be the sole beneficiary at the expense of the remaining stockholders is alone a very telling criticism of this feature of the plan.

Complaint was also made that the 4 per cent commission to the syndicate was excessive. Opinions on this question depend chiefly of one's views as to the general merit of the plan of exchanging preferred stock into bonds. If the conclusion be reached that the substitution of $150,000,000 of 5 per cent bonds for a like amount of 7 per cent preferred stock was in itself desirable and advantageous to the Corporation, then the payment of $6,800,000 in the form of a 4 per cent commission on this portion of the bond issue could perhaps be defended. If, however, such substitution of bonds for stock is regarded as inadvisable, then the payment of the 4 per cent commission for effecting such exchange becomes open to objection. It amounted, on this assumption, to the payment by the Corporation of $6,800,000 to the syndicate for raising $20,000,000 of cash; in other words, a commission of 34 per cent. Viewed in this light alone, it is impossible to avoid the conclusion that the commission was grossly excessive.

Without attempting to pass on this feature of the plan, it seems clear that the exclusive privilege allowed the syndicate of converting preferred stock into bonds was undesirable and unjustifiable. Certainly for the time being it seriously hurt the prestige of the Corporation.

Reasons for the conversion plan.—There has been a great deal of discussion as to why the directors of the Steel Corporation decided upon this conversion plan. One of the most probable reasons for its adoption is that the financial interests identified with the Corporation found that its enormous capitalization acted as a wet blanket upon the stock market at all times and, furthermore, that it constituted a very serious potential menace in the event of a sudden panic. Although the preferred stock of the Corporation was paying 7 per cent dividends, it was at that time regarded by conservative investors as distinctly a speculative security. Indeed, during the depression in the iron and steel industry in the winter of 1903–4, when the dividend on the common stock was first cut in two, and later suspended altogether, there were very grave fears that the Corporation would not be able to maintain dividends on even the preferred stock. This feeling among conservative investors undoubtedly prevented a rapid distribution of the preferred issue by banking interests who were carrying large amounts of this stock. A 5 per cent bond, on the other hand, might appeal more strongly to the investing class, and thus might afford a means for relieving the stock market of the pressure of the enormous capitalization of the Corporation to that extent. That is to say, if a large amount of the preferred stock of the Corporation then "on the market" could be withdrawn, exchanged into bonds, and placed with investors who would be disposed to hold the latter without much regard to temporary fluctuations in market conditions, the financial operations of banking interests in other directions would be facilitated to this extent. A special point in this connection is that some of the large insurance corporations, and other institutions of a similar character, might naturally be more ready to purchase a bond than preferred stock. There seems to be little doubt that this was a primary motive underlying the adoption of the conversion plan.

Another explanation sometimes advanced is that the plan was largely designed to increase the value of the common stock by reducing the prior charges. Some of the leading interests in the Steel Corporation claimed to be large owners of the common stock. It is difficult to believe, however, that this could have been a very important consideration in the minds of the directors, since the substitution of a bonded debt for the preferred stock can hardly be regarded as likely to improve the standing of the common stock with investors generally. It is true that the new bonds contained a provision to the effect that foreclosure proceedings could not be instituted under them until there had been a failure for a consecutive period of two years to pay interest. It is also true that the conversion operations reduced the charges coming ahead of the common stock. However, the influence of a bond issue is ordinarily more adverse to the common stock than that of an issue of preferred stock, and it hardly seems probable that the possibility of enhancing the value of the common stock was an important factor in bringing about this conversion plan.

Still another explanation offered for this plan was that it was a deliberate scheme to enable the underwriting syndicate to "milk" the Corporation.[1] While the anticipated profit of the syndicate undoubtedly was an important consideration, and while, as already pointed out, such underwriting profits were a very conspicuous feature of the consolidation movement in the steel industry throughout, it hardly seems reasonable to assume that the primary object of the directors of the Corporation in adopting this conversion plan was to secure a large profit for an underwriting syndicate of which only a part of them were members. While open to several serious objections, it seems more probable that the syndicate arrangement was an incident of the plan and not its chief object.

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[1] Thus one writer in discussing this plan said:

> It seems perfectly clear that an important motive for this transaction was to secure a large profit to prominent bankers who were represented at the same time on the board of directors of the Steel Corporation. (W. Z. Ripley, Quarterly Journal of Economics, February, 1905.)

CHAPTER IX.

RELATIVE POSITION OF THE UNITED STATES STEEL CORPORATION IN THE STEEL INDUSTRY.

Section 1. Comparison of Steel Corporation's production of principal products with that of independent concerns.

It is clear that the United States Steel Corporation at its organization, in 1901, overshadowed not only any individual competitor in the industry in the United States but all competitors combined. Since its organization the Corporation, as shown, has acquired several important independent concerns, and has also very greatly increased its capacity by the erection of new plants and the modernization and enlargement of old ones. Notwithstanding the resulting great expansion in the absolute volume of its business, however, the Corporation, from a manufacturing standpoint, has not increased its proportion of the total output of the country. On the contrary, in the case of several products, it has actually failed to maintain the position which it held in 1901. With respect to the ownership or control of raw materials, and particularly of ore, the case, as shown later (see sec. 6) is very different.

The production of the Steel Corporation, yearly, since its organization, has already been given in Table 30, on page 270. In Table 50, below, the Corporation's output of principal products, from 1901 to 1910, is compared with the combined output of independent companies, the total for the country also being given. These figures have been compiled from the annual statistical reports of the secretary of the American Iron and Steel Association, a recognized authority. It will be noted that the classification of products by the American Iron and Steel Association is somewhat different from that by the Steel Corporation itself, as given in Table 30, and, furthermore, that the statistics in Table 50 do not include certain semifinished products, such as billets, slabs, etc., which were included in Table 30. However, since the Iron and Steel Association statistics are presumably compiled on a uniform basis from year to year, they afford a satisfactory basis for the present discussion.

Table 50.—ANNUAL PRODUCTION OF ORE, COKE, AND IRON AND STEEL PRODUCTS BY UNITED STATES STEEL CORPORATION AND BY INDEPENDENT CONCERNS, 1901-1910.[1]

[From annual statistical reports of the American Iron and Steel Association.]

Product.	1901.				1902.			
	U. S. Steel Corporation.	Independent companies.	Total, all companies.	U. S. Steel Corp.'s percentage of total.	U. S. Steel Corporation.	Independent companies.	Total, all companies.	U. S. Steel Corp.'s percentage of total.
Iron ore:	*Gr. tons.*	*Gr. tons.*	*Gr. tons.*		*Gr. tons.*	*Gr. tons.*	*Gr. tons.*	
Production, all districts	12,692,213	16,195,266	28,887,479	43.9	16,063,179	19,490,956	35,554,135	45.1
Shipments from Lake region	12,692,213	7,897,024	20,589,237	61.6	16,659,470	10,911,651	27,571,121	60.4
Coke[2]	....	....	....	....	9,521,567	15,880,163	25,401,730	37.4
Pig iron, excluding spiegel, etc	6,613,503	8,973,390	15,586,893	42.4	7,802,812	9,805,514	17,608,326	44.3
Spiegeleisen, ferromanganese, etc	190,485	100,976	291,461	65.4	172,718	40,263	212,981	81.0
Ingots and castings:								
Bessemer	6,113,588	2,599,714	8,713,302	70.2	6,759,210	2,379,153	9,138,363	73.9
Open hearth	2,746,996	1,909,313	4,656,309	59.0	2,984,708	2,703,021	5,687,729	52.4
Total	8,860,584	4,509,027	13,369,611	66.3	9,743,918	5,082,174	14,826,092	65.7
Rolled products:								
Bessemer steel rails	1,719,076	1,151,740	2,870,816	59.9	1,920,786	1,014,606	2,935,392	65.4
Structural shapes	629,733	383,417	1,013,150	62.2	753,481	546,845	1,300,326	57.9
Plates and sheets[3]	1,456,897	797,528	2,254,425	64.6	1,583,865	1,081,544	2,665,409	59.4
Wire rods	1,059,859	306,075	1,365,934	77.6	1,126,826	447,467	1,574,293	71.5
Bars, skelp, nail plate, open-hearth and iron rails, and other finished rolled products	1,324,393	3,520,609	4,845,002	27.3	1,701,700	3,766,996	5,468,696	31.1
Total finished rolled products	6,189,958	6,159,369	12,349,327	50.1	7,086,658	6,857,458	13,944,116	50.8
Wire nails (kegs of 100 lbs.)	6,446,938	3,356,884	9,803,822	65.8	7,122,354	3,859,892	10,982,246	64.8
	1903.				1904.			
Iron ore:	*Gr. tons.*	*Gr. tons.*	*Gr. tons.*		*Gr. tons.*	*Gr. tons.*	*Gr. tons.*	
Production, all districts	15,363,355	19,655,953	35,019,308	43.8	10,503,087	17,141,243	27,644,330	37.9
Shipments from Lake region	14,293,083	9,996,795	24,289,878	58.8	11,746,409	10,076,430	21,822,839	53.8
Coke[2]	8,658,391	16,603,969	25,262,360	34.2	8,652,293	14,969,227	23,621,520	36.6
Pig iron, excluding spiegel, etc	7,123,053	10,693,538	17,816,591	39.9	7,213,933	9,062,708	16,276,641	44.3
Spiegeleisen, ferromanganese, etc	156,188	36,473	192,661	81.0	155,488	64,904	220,392	70.5

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[1] These statistics for 1901 cover the business of the constituent concerns of the United States Steel Corporation for the entire calendar year and not merely for the nine months covered by the operations of that concern.

[2] All figures for coke are given in net tons.

[3] Including black plates for tinning, but excluding nail plate.

TABLE 50.—ANNUAL PRODUCTION OF ORE, COKE, AND IRON AND STEEL PRODUCTS BY UNITED STATES STEEL CORPORATION AND BY INDEPENDENT CONCERNS, 1901-1910—Continued.

[From annual statistical reports of the American Iron and Steel Association.]

Product.	1903—Continued.				1904—Continued.			
	U.S. Steel Corporation.	Independent companies.	Total, all companies.	U. S. Steel Corp.'s percentage of total.	U. S. Steel Corporation.	Independent companies.	Total, all companies.	U. S. Steel Corp.'s percentage of total.
Ingots and castings:	*Gr. tons.*	*Gr. tons.*	*Gr. tons.*		*Gr. tons.*	*Gr. tons.*	*Gr. tons.*	
Bessemer	6,191,660	2,401,169	8,592,829	72.0	5,427,979	2,431,161	7,859,140	69.0
Open hearth	2,976,300	2,853,611	5,829,911	51.0	2,978,399	2,929,767	5,908,166	50.4
Total	9,167,960	5,254,780	14,422,740	63.5	8,406,378	5,360,928	13,767,306	61.0
Rolled products:								
Bessemer steel rails	1,934,315	1,012,441	2,946,756	65.6	1,223,884	914,073	2,137,957	57.2
Structural shapes	660,978	434,835	1,095,813	60.3	523,854	425,292	949,146	55.1
Plates and sheets [1]	1,557,223	1,042,442	2,599,665	59.9	1,406,397	1,015,001	2,421,398	58.0
Wire rods	1,100,290	403,165	1,503,455	73.1	1,212,012	487,016	1,699,028	71.3
Bars, skelp, nail plate, open-hearth and iron rails, and other finished rolled products	1,510,085	3,551,923	5,062,008	29.8	1,378,651	3,427,201	4,805,852	28.6
Total finished rolled products	6,762,891	6,444,806	13,207,697	51.2	5,744,798	6,268,583	12,013,381	47.8
Wire nails (kegs of 100 lbs.)	6,801,180	2,830,481	9,631,661	70.6	7,998,912	3,927,749	11,926,661	67.0
	1905.				1906.			
Iron ore:	*Gr. tons.*	*Gr. tons.*	*Gr. tons.*		*Gr. tons.*	*Gr. tons.*	*Gr. tons.*	
Production, all districts	18,486,556	24,039,577	42,526,133	43.4	20,645,148	27,104,580	47,749,728	43.2
Shipments from Lake region	19,251,872	15,101,584	34,353,456	56.0	20,885,774	17,637,665	38,523,439	54.2
Coke [2]	12,242,909	19,988,220	32,231,129	37.9	13,295,075	23,106,142	36,401,217	36.5
Pig iron, excluding spiegel, etc	9,951,891	12,746,513	22,698,404	43.8	11,061,794	13,939,755	25,001,549	44.2
Spiegeleisen, ferromanganese, etc	220,257	73,719	293,976	74.9	205,583	100,059	305,642	67.2
Ingots and castings:								
Bessemer	7,379,188	3,562,187	10,941,375	67.4	8,072,655	4,203,175	12,275,830	65.7
Open hearth	4,616,051	4,355,325	8,971,376	51.4	5,456,544	5,523,869	10,980,413	49.6
Total	11,995,239	7,917,512	19,912,751	60.2	13,529,199	9,727,044	23,256,243	58.1
Rolled products:								
Bessemer steel rails	1,713,610	1,478,737	3,192,347	53.6	1,995,868	1,795,591	3,791,459	52.6
Structural shapes	908,096	752,423	1,660,519	54.6	1,157,271	961,501	2,118,772	54.6
Plates and sheets [1]	2,028,429	1,503,801	3,532,230	57.4	2,354,790	1,827,366	4,182,156	56.3
Wire rods	1,265,707	542,981	1,808,688	69.9	1,342,391	529,223	1,871,614	71.7

[1] Including black plates for tinning, but excluding nail plate.

[2] All figures for coke are given in net tons.

Table 50.—ANNUAL PRODUCTION OF ORE, COKE, AND IRON AND STEEL PRODUCTS BY UNITED STATES STEEL CORPORATION AND BY INDEPENDENT CONCERNS, 1901-1910—Continued.

[From annual statistical reports of the American Iron and Steel Association.]

Product.	1905—Continued.				1906—Continued.			
	U. S. Steel Corporation.	Independent companies.	Total, all companies.	U. S. Steel Corp.'s percentage of total.	U. S. Steel Corporation.	Independent companies.	Total, all companies.	U. S. Steel Corp.'s percentage of total.
Rolled products—Contd.								
Bars, skelp, nail plate, open-hearth and iron rails, and other finished rolled products.	*Gr. tons.* 2,063,113	*Gr. tons.* 4,583,118	*Gr. tons.* 6,646,231	31.0	*Gr. tons.* 2,582,626	*Gr. tons.* 5,041,841	*Gr. tons.* 7,624,467	33.8
Total finished rolled products..	7,978,955	8,861,060	16,840,015	47.3	9,432,946	10,155,522	19,588,468	48.1
Wire nails (kegs of 100 lbs.)................	7,175,418	3,679,474	10,854,892	66.1	7,524,114	3,962,533	11,486,647	65.5
	1907.				1908.			
Iron ore:	*Gr. tons.*	*Gr. tons.*	*Gr. tons.*		*Gr. tons.*	*Gr. tons.*	*Gr. tons.*	
Production, all districts	22,403,801	29,316,818	51,720,619	43.3	16,662,715	19,320,621	35,983,336	46.3
Shipments from Lake region...............	23,148,467	19,096,603	42,245,070	54.7	14,579,613	11,435,374	26,014,987	56.0
Coke[1]..................	12,373,938	28,405,626	40,779,564	30.3	8,169,931	17,863,587	26,033,518	31.3
Pig iron, excluding spiegel, etc............	10,633,496	14,808,517	25,442,013	41.7	6,819,064	8,964,936	15,784,000	43.2
Spiegeleisen, ferromanganese, etc............	186,472	152,876	339,348	54.9	115,344	36,674	152,018	75.8
Ingots and castings:								
Bessemer..............	7,556,460	4,111,089	11,667,549	64.7	4,055,275	2,061,480	6,116,755	66.2
Open hearth...........	5,543,088	6,006,648	11,549,736	47.9	3,783,438	4,053,291	7,836,729	48.2
Total..............	13,099,548	10,117,737	23,217,285	56.4	7,838,713	6,114,771	13,953,484	56.1
Rolled products:								
Bessemer steel rails....	1,744,578	1,635,447	3,380,025	51.6	790,630	558,523	1,349,153	58.6
Open-hearth steel rails.	....	....	....	....	265,067	306,724	571,791	46.3
Structural shapes......	1,066,727	873,625	1,940,352	54.9	510,343	572,838	1,083,181	47.1
Plates and sheets[2].....	2,372,498	1,876,334	4,248,832	55.8	1,377,089	1,272,604	2,649,693	51.9
Wire rods..............	1,443,191	574,392	2,017,583	71.5	1,234,220	582,729	1,816,949	67.9
Bars, skelp, nail plate, open-hearth and iron rails, and other finished rolled products.	2,814,042	5,463,988	8,278,030	33.9	1,394,179	2,963,247	4,357,426	31.9
Total finished rolled products.	9,441,036	10,423,786	19,864,822	47.5	5,571,528	6,256,665	11,828,193	47.1
Wire nails (kegs of 100 lbs.)................	7,794,546	3,936,498	11,731,044	66.4	6,529,718	4,133,254	10,662,972	61.2
Tin plates and terne plates................	....	....	....	....	386,718	150,369	537,087	72.0

[1] All figures for coke are given in net tons.

[2] Including black plates for tinning, but excluding nail plate.

TABLE 50.—ANNUAL PRODUCTION OF ORE, COKE, AND IRON AND STEEL PRODUCTS BY UNITED STATES STEEL CORPORATION AND BY INDEPENDENT CONCERNS, 1901-1910—Continued.

[From annual statistical reports of the American Iron and Steel Association.]

Product.	1909.				1910.			
	U. S. Steel Corporation.	Independent companies.	Total, all companies.	U. S. Steel Corp.'s percentage of total.	U. S. Steel Corporation.	Independent companies.	Total, all companies.	U. S. Steel Corp.'s percentage of total.
Iron ore:	*Gr. tons.*	*Gr. tons.*	*Gr. tons.*		*Gr. tons.*	*Gr. tons.*	*Gr. tons.*	
Production, all districts	23,431,047	27,863,224	51,294,271	45.7	25,245,816	....	....	....
Shipments from Lake region	21,876,246	20,710,623	42,586,869	51.4	22,185,972	21,256,425	43,442,397	51.0
Coke [1]	13,590,112	25,724,953	39,315,065	34.6	13,649,578	28,059,232	41,708,810	32.7
Pig iron, excluding spiegel, etc.	11,455,200	14,115,231	25,570,431	44.8	11,657,762	15,421,374	27,079,136	43.0
Spiegeleisen, ferromanganese, etc.	163,150	61,890	225,040	72.5	173,636	50,795	224,431	77.4
Ingots and castings: [2]								
Bessemer	5,846,300	3,484,483	9,330,783	62.7	5,796,223	3,616,549	9,412,772	61.6
Open hearth	7,508,889	6,985,047	14,493,936	51.8	8,383,146	8,121,363	16,504,509	50.8
Total	13,355,189	10,469,530	23,824,719	56.0	14,179,369	11,737,912	25,917,281	54.7
Rolled products:								
Bessemer steel rails	1,012,512	754,659	1,767,171	57.3	1,134,381	750,061	1,884,442	60.2
Open-hearth steel rails	722,605	534,069	1,256,674	57.5	1,004,565	746,794	1,751,359	57.4
Structural shapes	1,071,018	1,204,544	2,275,562	47.1	1,163,300	1,103,590	2,266,890	51.3
Plates and sheets [3]	2,108,576	2,125,770	4,234,346	49.8	2,380,106	2,575,378	4,955,484	48.0
Wire rods	1,626,936	708,749	2,335,685	69.7	1,508,294	733,536	2,241,830	67.3
Bars, skelp, nail plate, iron rails, and other finished rolled products	3,063,659	4,711,593	7,775,252	39.4	3,203,279	5,317,995	8,521,274	37.6
Total finished rolled products	9,605,306	10,039,384	19,644,690	48.9	10,393,925	11,227,354	21,621,279	48.1
Wire nails (kegs of 100 lbs.)	8,442,500	5,473,553	13,916,053	60.7	7,041,692	5,663,210	12,704,902	55.4
Tin plates and terne plates	378,767	233,192	611,959	61.9	440,694	282,076	722,770	61.0

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[1] All figures for coke are given in net tons.

[2] The division of the total production between Bessemer and open hearth is not given by the American Iron and Steel Association in these years. The figures for the Steel Corporation alone appear in Table 30 (p. 270).

[3] Including black plates for tinning, but excluding nail plate.

Section 2. Percentages of country's production of principal iron and steel products controlled by Steel Corporation.

The relative position of the Steel Corporation from a manufacturing standpoint may be better seen from the following table—based upon Table 50—which gives simply the Corporation's percentages of the country's production of these leading iron and steel products during this period. It may be noted that the percentages for pig iron and spiegeleisen, ferromanganese, etc., in addition to being stated separately, are in this table combined.

TABLE 51.—PROPORTION OF TOTAL UNITED STATES PRODUCTION OF IRON ORE, COKE, AND VARIOUS IRON AND STEEL PRODUCTS CONTROLLED BY THE UNITED STATES STEEL CORPORATION, YEARLY, 1901–1910.

[From annual statistical reports of the American Iron and Steel Association.]

Product.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
Iron ore:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Production, all districts	43.9	45.1	43.8	37.9	43.4	43.2	43.3	46.3	45.7	(3)
Shipments from Lake region	61.6	60.4	58.8	53.8	56.0	54.2	54.7	56.0	51.4	51.0
Coke	(3)	37.4	34.2	36.6	37.9	36.5	30.3	31.3	34.6	32.7
Pig iron	42.4	44.3	39.9	44.3	43.8	44.2	41.7	43.2	44.8	43.0
Spiegeleisen, ferromanganese, etc	65.4	81.0	81.0	70.5	74.9	67.2	54.9	75.8	72.5	77.4
Total pig iron, spiegel, ferro, etc	42.9	44.7	40.4	44.6	44.2	44.5	41.9	43.5	45.0	43.3
Ingots and castings: [1]										
Bessemer	70.2	73.9	72.0	69.0	67.4	65.7	64.7	66.2	62.7	61.6
Open hearth	59.0	52.4	51.0	50.4	51.4	49.6	47.9	48.2	51.8	50.8
Total	66.3	65.7	63.5	61.0	60.2	58.1	56.4	56.1	56.0	54.7
Rolled products:										
Bessemer steel rails	59.9	65.4	65.6	57.2	53.6	52.6	51.6	58.6	57.3	60.2
Open-hearth steel rails	(4)	(4)	(4)	(4)	(4)	(4)	(4)	46.3	57.5	57.4
Structural shapes	62.2	57.9	60.3	55.1	54.6	54.6	54.9	47.1	47.1	51.3
Plates and sheets [2]	64.6	59.4	59.9	58.0	57.4	56.3	55.8	51.9	49.8	48.0
Wire rods	77.6	71.5	73.1	71.3	69.9	71.7	71.5	67.9	69.7	67.3
Bars, skelp, nail plate, iron rails, and other finished rolled products	27.3	31.1	29.8	28.6	31.0	33.8	33.9	31.9	39.4	37.6
Total finished rolled products	50.1	50.8	51.2	47.8	47.3	48.1	47.5	47.1	48.9	48.1
Wire nails (kegs of 100 lbs.)	65.8	64.8	70.6	67.0	66.1	65.5	66.4	61.2	60.7	55.4
Tin plates and terne plates	(3)	(3)	(3)	(3)	(3)	(3)	(3)	72.0	61.9	61.0

[1] See note 2, page 363.

[2] Including black plates for tinning, but excluding nail plate.

[3] Data not available.

[4] None produced by Corporation.

The Steel Corporation itself prepared a comparative statement of similar percentages with, however, a somewhat different classification. The Corporation, it should be noted, relied largely upon the reports of the American Iron and Steel Association. Its figures are given in Table 52. They are, in most instances, substantially the same for the same products as those compiled by the American Iron and Steel Association except that in 1907 the Steel Corporation's figures include the production of the Tennessee Coal, Iron and Railroad Company, while those of the American Iron and Steel Association do not. The Corporation's figures for ingots and castings, moreover, include certain special steels, the tonnage of which is small, while those of the Association, as here given, do not.[1]

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[1] In 1909 and 1910 the Association included special steels in its ingot figures, but they have been excluded by the Bureau so as to keep the Association's statistics on a uniform basis.

TABLE 52.—STEEL CORPORATION'S PERCENTAGES OF TOTAL PRODUCTION IN THE UNITED STATES OF PIG IRON AND VARIOUS STEEL PRODUCTS, AS COMPUTED BY THE CORPORATION, 1901–1910.

[These data are based upon actual tonnage produced, except as otherwise noted, as furnished by statistics published by the American Iron and Steel Association supplemented by investigation made by the United States Steel Corporation.[1]]

Year.	Pig iron, spiegel, and ferro.		Steel ingots and castings.		Rails.		Structural shapes.		Plates and sheets of all kinds.[2]		Black plate produced in tin mills.	
	U. S. Steel.	Other.	U. S. Steel.	Other.	U. S. Steel.	Other.	U. S. Steel.	Other.	U. S. Steel.	Other.	U. S. Steel.	Other.
1901	43.2	56.8	65.7	34.3	59.8	40.2	62.2	37.8	64.6	35.4	79.8	20.2
1902	44.8	55.2	65.2	34.8	67.6	32.4	57.9	42.1	59.4	40.6	70.7	29.3
1903	40.4	59.6	63.1	36.9	64.4	35.6	60.3	39.7	59.9	40.1	77.6	22.4
1904	44.7	55.3	60.7	39.3	54.3	45.7	55.1	44.9	58.0	42.0	71.5	28.5
1905	44.2	55.8	60.0	40.0	51.2	48.8	54.6	45.4	57.4	42.6	67.9	32.1
1906	44.5	55.5	57.8	42.2	50.2	49.8	54.6	45.4	56.3	43.7	70.4	29.6
1907[3]	44.3	55.7	57.1	42.9	52.2	47.8	54.9	45.1	55.8	44.2	69.1	30.9
1908[3]	43.5	56.5	55.9	44.1	55.0	45.0	47.1	52.9	51.9	48.1	67.6	32.4
1909[3]	45.0	55.0	55.8	44.2	57.4	42.6	47.0	53.0	49.7	50.3	60.0	40.0
1910[3]	43.4	56.6	54.3	45.7	58.9	41.1	(4)	(4)	(4)	(4)	52.9	47.1

Year.	Coated tin-mill products.		Black and coated sheets produced in sheet mills.		Wire rods.[5]		Wire nails.		Wrought pipe and tubes.[6]		Seamless tubes.[6]	
	U. S. Steel.	Other.	U. S. Steel.	Other.	U. S. Steel.	Other.	U. S. Steel.	Other.	U. S. Steel.	Other.	U. S. Steel.	Other.
1901	73.1	26.9	67.3	32.7	77.7	22.3	68.1	31.9	57.2	42.8	82.8	17.2
1902	71.4	28.6	58.1	41.9	71.6	28.4	64.8	35.2	53.0	47.0	72.2	27.8
1903	76.4	23.6	51.4	48.6	73.1	26.9	71.6	28.4	54.6	45.4	64.1	35.9
1904	71.4	28.6	52.8	47.2	71.5	28.5	68.2	31.8	51.1	48.9	64.1	35.9
1905	71.3	28.7	58.4	41.6	69.9	30.1	67.4	32.6	54.0	46.0	60.8	39.2
1906	73.5	26.5	52.7	47.3	71.7	28.3	65.2	34.8	52.4	47.6	65.5	34.5
1907[3]	72.6	27.4	50.6	49.4	71.5	28.5	69.4	30.6	53.3	46.7	66.4	33.6
1908[3]	71.1	28.9	41.3	58.7	67.9	32.1	67.6	32.4	47.4	52.6	66.3	33.7
1909[3]	61.9	38.1	40.7	59.3	69.7	30.3	60.9	39.1	43.7	56.3	61.0	39.0
1910[3]	61.1	38.9	38.9	61.1	67.3	32.7	55.5	44.5	38.2	61.8	55.3	44.7

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[1] The relative percentages shown in the above statement are based upon gross production. However, as related to the domestic consumption within the United States of the several products, the above percentages given for United States Steel overstate its relative position. This is because approximately 10 per cent of the Steel Corporation's output is shipped in the export trade, while all other manufacturers in the United States as a whole conduct a comparatively small export business. Making allowance for this export tonnage, it is estimated by the Corporation that its tonnage is equal in total to somewhat less than 50 per cent of the entire steel produced in the United States which is sold for domestic uses.

[2] Includes sheets for tinning, galvanizing, and other coatings.

[3] Tennessee Coal, Iron and Railroad Company included with Steel Corporation in these years.

[4] Data not available.

[5] The percentages given for wire rods also overstate the relative position of the Corporation as to the wire industry as represented by wire for consumption, because of the fact that the Corporation has sold annually from 8 to 10 per cent of its output of wire rods.

[6] These percentages are based on capacity, not production, and moreover, the capacity of "other" companies is partly estimated. The comparison does not include cast-iron pipe, which the Steel Corporation does not make at all.

For the purposes of the present discussion it will be found convenient to use the classification given in Table 51, referring from time to time to the percentages computed by the Steel Corporation. From an examination of Table 51 it will be seen that the Corporation has maintained its relative position in the industry much better in the case of iron ore and pig iron than in the case of crude steel and finished steel products. The changes in its relative position may best be seen by a discussion of the important products separately.

Iron ore.—With respect to the production of iron ore, it will be seen that the Corporation has well maintained the position which it held in 1901. Indeed, the figures for recent years show that its percentage of the total production of the country is somewhat greater than it was in 1901. Thus, in 1908 the Corporation produced 46.3 per cent of the total ore output of the country, and in 1909, 45.7 per cent, as compared with 43.9 per cent in 1901. (The 1910 figures have not yet been published by the Association. The Corporation's proportion in that year, however, based upon Geological Survey figures, was 44.4 per cent.)

A striking feature of these percentages for ore is their comparative uniformity. Except for 1904, the Corporation's percentage of the total production never fell as low as 43 per cent, and in only one year exceeded 46 per cent.

These percentages of production are based upon the total output of the country. Taking ore shipments from the Lake region (the production of mines in that region alone not being shown by the American Iron and Steel Association's reports), the Steel Corporation had a distinctly larger share of the business than it had of the total production of the country. The average for the period 1901–1908 was in the neighborhood of 56 per cent, as against an average of, roughly, 44 per cent of the total production. However, while the Steel Corporation's share of the country's production has been well maintained, with, in fact, an increasing tendency (chiefly on account of the acquisition of the Tennessee Coal, Iron and Railroad Company), its share of the shipments from the Lake Superior region has declined rather sharply, especially since 1908, its percentage in 1910 being only 51 as against 61.6 in 1901.

Generally speaking it may be said that the Steel Corporation has since its organization controlled approximately 45 per cent of the production of the country's ore and substantially 55 per cent of the shipments of ore from the Lake Superior region alone. Since the bulk of the ore used for steel-making purposes comes from the Lake region, the latter percentage is the better index to the real position of the Steel Corporation as an ore producer. The actual production of ore by the Steel Corporation in 1910, as will be seen from Table 50, was in excess of 25,000,000 tons, of which approximately

23,000,000 tons was from its Lake Superior mines. Almost 18,000,000 tons of the Corporation's total for the year was from the Mesabi Range alone.

COKE.—Table 51 shows that the Steel Corporation not only occupies a much less important position in the coke industry than in the ore industry, but also that its percentage of the country's coke production has been gradually reduced since its organization. Thus, from 37.4 per cent in 1902 (figures for 1901 not being available), the Corporation's share of the coke production of the country had by 1910 fallen below 33 per cent; in 1907 and 1908 it was somewhat lower.

These percentages for coke are somewhat misleading, for the reason that a considerable amount of the total production under discussion is for other than iron and steel making purposes, and the percentages, therefore, tend to understate the importance of the Steel Corporation in this branch of the coke business.[1] If statistics of production of coke for iron and steel making purposes alone were available, the Corporation's percentages would be distinctly higher.

PIG IRON.—The striking feature of the Corporation's percentages of pig-iron production is their close similarity to those for ore, not only in the figures themselves but in their comparatively moderate fluctuations during the period covered. Thus, the extreme range in these percentages (including ferromanganese, etc.) in Table 51 was from 40.4 per cent to 45 per cent, and excluding the year 1903, from only 41.9 per cent to 45 per cent. When it is recalled that during this period the large pig-iron capacity of the Union-Sharon and Clairton steel companies and of the Tennessee Coal, Iron and Railroad Company was acquired, not to mention still larger additions by new furnaces built (see Table 29, p. 269), the failure of the Corporation to substantially increase its percentage is a striking indication of the rapid growth of independent production.

The Steel Corporation's own percentages of its production of pig iron, as given in Table 52 (these, as already stated, being based upon the total figures of production as compiled by the American Iron and Steel Association), are substantially identical with those compiled by the Association itself, except for 1901 and 1907.

The discrepancy between the two sets of figures in 1901 was apparently due to the fact that certain revisions of the figures of that year were subsequently made by the Steel Corporation which are not taken account of in the figures of the American Iron and Steel Association, while the difference in 1907 is due, as already stated, to the fact that the Steel Corporation's percentages include the production of the Tennessee Coal, Iron and Railroad Company, while those of the American Iron and Steel Association do not. The percentages of the Tennessee Coal, Iron and Railroad Company's pig iron-production to the total of the country from 1907 to 1910, inclusive, were as follows:

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[1] It should be noted, however, that the production of coke, as given in Table 50, does not include coke produced as a by-product of illuminating gas, commercially known as "gas-house coke."

1907	2.3
1908	3.2
1909	2.2
1910	2.8

It will be seen, therefore, that had it not been for the absorption of the Tennessee concern the Steel Corporation would have suffered a perceptible decline in its position as a producer of pig iron in the past few years.

During the ten-year period there was, of course, a very great increase in the production of pig iron. The total increase and the relative increase by the Steel Corporation and by independent companies are given in the following summary:

	1901.	1910.	Increase.	
	Tons.	*Tons.*	*Tons.*	*Per cent.*
By United States Steel Corporation interests	6,855,731	11,831,398	4,975,667	72.6
By independent companies	9,022,623	15,467,147	6,444,524	71.4
Total for United States	15,878,354	27,298,545	11,420,191	71.9

As already pointed out, the percentages of the Corporation's production above given do not give an adequate idea of its importance in the pig-iron branch of the steel industry, for the reason that a considerable part of the country's pig-iron output is used for the manufacture of foundry iron and for other purposes which do not bring it extensively into the field of the United States Steel Corporation, which is, of course, preeminently a steel-making concern.

From what has been said, therefore, it will be seen that the Steel Corporation's position in the iron-ore industry and in the production of the first crude material of the steel industry (pig iron) has been fairly well maintained at the percentages recorded at the time the Corporation was formed in 1901. The Corporation's percentage of coke, on the other hand, has fallen off somewhat, but allowing for the fact, above noted, that the percentages are based on a total which includes a considerable amount of coke not used in the steel industry, this decline probably would not have been especially marked. Therefore, in what may be called the "raw material" branches of the steel industry, the Steel Corporation practically has not lost much ground since its organization, but, on the contrary, has in the case of ore production strengthened its position, chiefly as a result of the purchase of the Tennessee Coal, Iron and Railroad Company. With respect to shipments of Lake ore, however, the Corporation has not held its own.

INGOTS AND CASTINGS.—The percentages of these crude-steel products probably afford the best single index of the Steel Corporation's position in the steel manufacturing industry. It will be seen from Table 51 that they disclose a decided recession in the relative standing of the Corporation. Thus, whereas in 1901 and 1902 the Corporation produced substantially 66 per cent of the country's crude steel, for the past few years its average has been only a little over 56 per cent, and in 1910 less than 55 per cent. This decline in the Steel Corporation's position has taken place despite the fact, brought out in Table 29, on page 269, that the crude-steel capacity of the Corporation has been increased from approximately 9,425,000 tons to over 18,000,000 tons, or by nearly 100 per cent, while its actual production increased from 8,860,000 tons in 1901 to over 14,170,000 tons in 1910. In other words, notwithstanding such important acquisitions as the Union-Sharon and Clairton steel companies, and the Tennessee Coal, Iron and Railroad Company, and despite the erection of its enormous Gary plant and other very important additions to its crude-steel works, the Corporation has failed by a considerable margin to hold its original position in this branch of the industry. This means, of course, that there has been a very rapid growth in the operations of its competitors. Moreover, these competitors are at the present time extending their operations.

The relatively much greater increase in the production of ingots and castings by independent manufacturers than by the Steel Corporation is well brought out by the following summary, comparing the production of the two groups of interests in 1901 and 1910:

	1901.	1910.	Increase.	
	Tons.	*Tons.*	*Tons.*	*Per cent.*
By United States Steel Corporation interests	8,854,820	14,179,369	5,324,549	60
By all other manufacturers	4,618,775	11,737,912	7,119,137	154
Total for United States	13,473,595	25,917,281	12,443,686	92

The Steel Corporation's percentages of the country's total production of steel ingots and castings, as computed by itself (see Table 52), are substantially identical with those compiled by the American Iron and Steel Association.

The principal reason for the small differences that do exist appears to be that the statistics of the American Iron and Steel Association include in the figures for the Steel Corporation certain special steels, but do not include such special steels in the grand total for the country. The percentages as figured by the Steel Corporation, on the other hand, include all steel of every description in both cases. In 1907, moreover, the Steel Corporation's percentages include returns for the Tennessee Coal, Iron and Railroad Company, whereas those of the American Iron and Steel Association do not.

It is worth noting that both sets of percentages show a decrease in the Corporation's share of the production of ingots and castings in every year since the company was organized. Furthermore, both sets show that the Steel Corporation's percentage in 1910 was less than 55 per cent, as compared with approximately 66 per cent in 1901.

Another striking feature of these statistics is that although the large crude-steel production of the Corporation's immense Gary plant is exclusively from open-hearth furnaces, the addition of this plant had only an insignificant effect upon the Corporation's share of even the open-hearth steel production of the country. This is due to the fact, of course, that the increase in steel capacity by its competitors has also been chiefly through open-hearth manufacture. As may be seen from Table 50, the Steel Corporation's production of open-hearth crude steel in 1901 was less than 2,750,000 tons, whereas in 1910 it exceeded 8,380,000 tons. Its production of Bessemer steel ingots and castings, on the other hand, after rising from, roughly, 6,114,000 tons in 1901 to over 8,000,000 in 1906, had declined by 1910 to less than 5,800,000 tons.[1]

This relatively rapid development of the open-hearth steel business of the Corporation has a direct bearing upon its pig-iron production. It will be noted that the Corporation's production of crude steel has in every year considerably exceeded its production of pig iron. The excess, yearly, for the period covered has been as follows:

TABLE 53.—COMPARISON OF PIG-IRON PRODUCTION OF STEEL CORPORATION WITH ITS CRUDE-STEEL PRODUCTION, 1901-1910.

Year.	Production of pig-iron, spiegel, etc.	Production of ingots and castings.	Excess of crude steel over pig-iron production.
	Tons.	*Tons.*	*Tons.*
1901	6,855,731	8,854,820	1,999,089
1902	7,975,530	9,743,918	1,768,388
1903	7,279,241	9,167,960	1,888,719
1904	7,369,421	8,406,378	1,036,957
1905	10,172,148	11,995,239	1,823,091
1906	11,267,377	13,511,149	2,243,772
1907	10,819,968	13,099,548	2,279,580
1908	6,934,408	7,838,713	904,305
1909	11,618,350	13,355,189	1,736,839
1910	11,831,398	14,179,369	2,347,971

In the first few years after its organization the Steel Corporation purchased a considerable amount of pig iron from "merchant" furnaces, its pig-iron capacity not being equal to the demands of its steel works. Such purchases account in part for the excess of the production of ingots and castings over the production of pig iron in these earlier years. A more important factor, however, was the use of scrap metal in open-hearth steel plants.

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[1] These figures taken from the 1910 annual report of the Corporation.

Through its acquisition of the Union-Sharon and Clairton steel companies, in 1902 and 1904, respectively, the Steel Corporation made a considerable addition to its pig-iron capacity, but the steel-ingot capacity of these concerns was even greater than their pig-iron capacity, so that relatively the pig-iron production of the Corporation, which had been somewhat deficient as compared with its requirements for the manufacture of steel products, was not increased. Through the purchase of the Tennessee Coal, Iron and Railroad Company, however (see p. 269), the Corporation added 1,000,000 tons to its pig-iron capacity, and only half that amount to its steel-ingot capacity.

Notwithstanding this important acquisition, however, and notwithstanding the erection of many new modern furnaces of large capacity, it will be seen that the excess of the crude-steel output of the Corporation over its pig-iron production has increased in recent years. This does not mean that the Corporation has relied to an increasing extent upon outside furnaces for its supply of pig iron. In fact, the reverse is true. This increase in the excess of steel capacity over pig-iron output is largely explained by the more rapid development of the open-hearth process just described. In the manufacture of open-hearth steel a very large proportion of scrap iron and steel is utilized, and also some ore, whereas the Bessemer process is almost entirely dependent upon pig iron from blast furnaces. It should be clearly understood, therefore, that the excess of steel over pig-iron production shown by the above figures does not mean that the Steel Corporation has purchased any such quantity of pig iron in the open market to meet its steel manufacturing requirements, but instead that the Corporation has been able to use an increasing amount of scrap iron and steel, thus reducing, relatively speaking, its pig-iron requirements. A part of the excess in any given year, moreover, may have been due to consumption of inventory stocks of iron carried over from previous years, but this, on the whole, is a minor consideration.

Rolled products.—Taking the various rolled products as a group, it will be noted that the percentages (see Table 51) show that the Steel Corporation's position has been fairly well maintained, its share in 1910 being 48.1 per cent as compared with about 50 per cent in 1901. Individual products, however, show some striking variations. Thus it will be seen that the Corporation's production of Bessemer steel rails, after falling from 65.6 per cent in 1903 to 51.6 per cent in 1907, rose in 1908 to 58.6 per cent; the percentage for 1910 was 60.2. The early decrease in the Corporation's percentage for this product was chiefly due to the opening of the important rail mill of the Lackawanna Steel Company at its new Buffalo plant (see p. 96), while the recovery in 1908 is chiefly attributable to the acquisition of the Tennessee Coal, Iron and Railroad Company by the Steel Corporation, which, it will be recalled, occurred at the close of 1907. A more important consideration in connection with steel rails, however, was the opening of a rail mill by the Steel Corporation in 1909 at its Gary, Ind., plant, which used open-hearth steel. In order to get a correct idea of the Steel Corporation's position in the steel rail business, therefore, it is necessary to combine the statistics for Bessemer and open-hearth rails (not the percentages as given in this table). Thus in 1910 the Steel Corporation's actual production of Bessemer and open-hearth steel rails was in excess of 2,110,000 tons. This, however, was only 58.8 per cent of the country's total production of both classes, so that notwithstanding the great increase in the output of the Steel Corporation that concern did not materially strengthen its position in the steel-rail business as a whole.

In the case of several of the finished rolled products the Corporation has suffered serious loss of ground. In structural shapes and in plates and sheets the decrease in its percentage has been very important. Thus its percentage of the production of structural shapes fell from 62.2 per cent in 1901 to 51.3 per cent in 1910,[1] while its percentage of the output of plates and sheets fell from 64.6 per cent to 48 per cent during the same interval. In wire rods the Corporation's percentage has fallen from 77.6 to 67.3 per cent. The movement in wire nails has been similar, although the percentages themselves are throughout somewhat smaller than those for wire rods. In this connection it is worth pointing out that in 1910 the Jones & Laughlin Steel Company and the Cambria Steel Company had important wire-rod and wire plants under construction. Moreover, it has recently been reported that the Lackawanna Steel Company was likely to enter this branch of the steel business.

Statistics for tin plate production for the earlier years are not given by the American Iron and Steel Association, but the percentages compiled by the Steel Corporation itself (see Table 52) show that in 1901 it produced over 73 per cent of the total production of the country. The percentage for 1910 was about 61, thus indicating a marked recession in the Corporation's position with respect to this product, or, in other words, a decided relative increase in outside production.

SUMMARY.—It will be seen, therefore, that two important facts are brought out by these various percentages—first, that the Steel

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[1] It may be noted that the Corporation's computation (see Table 52) gives its percentage of structural shapes for 1909 at 47 per cent. The increase indicated by the American Iron and Steel Association's figures in 1910 may have been due to the operation of the Gary plant. The American Iron and Steel Association's figure for 1909, it will be seen, is 47.1, or practically identical with that of the Corporation.

Corporation has well maintained its position with respect to the cruder materials—ore, coke and pig iron—and in fact has in some instances increased its share of the country's total production; but, second, that in the case of crude steel and most leading steel products, with the exception of steel rails, the Corporation, notwithstanding the great additions to its plant capacity, both through new construction and through acquisition, has not kept pace with its competitors, but has suffered more or less pronounced retrogression. The result has been that whereas at its organization in 1901 the Corporation may be fairly said to have controlled about 60 per cent of the entire crude steel and finished steel business of the country, at the close of 1910 its percentage was not much over 50 per cent. These facts alone clearly show that the Steel Corporation not only does not have a monopoly of the manufacturing branch of the steel industry as a whole, but furthermore that any monopolistic control which it may have had in this respect at its organization has been materially weakened during the past ten years. In other words, these figures mean that the United States Steel Corporation, large as it is, has not prevented competition (at least, competition in production) in the steel industry as a whole up to this time. Even in those lines of production in which the Steel Corporation had a quasi-monopolistic position at the time of its formation, such as wire, tin plate, and certain kinds of tubes, it has lost considerable ground in the last few years.

While, therefore, these statistics clearly show the existence of increasing independent production, it should be clearly understood that competition has not been particularly evident with respect to prices, where it has been materially modified by the existence of a price policy described as "cooperation." This will be discussed in a later part of the report.

Section 3. Position of Steel Corporation from standpoint of capacity and location of its plants.

The foregoing discussion has been based upon statistics of actual production. From the standpoint of capacity the Steel Corporation probably is in a somewhat stronger position than these figures of production alone would indicate.

During periods of depression the proportion of the Corporation's output to the total has generally been smaller than its proportion of capacity, owing to its policy of trying to maintain prices, but it is probable that if a period of violent competition occurred the Steel Corporation could easily increase its proportions of the total production and even eliminate permanently some of its weaker rivals.

In the distribution of its plants the Steel Corporation has, of course, a distinct advantage over any individual competitor. Not only has it the largest and most important plants in the Pittsburg and Valley districts, but it is by far the largest producer in the Chicago district, which includes its great Gary plant, while in the South, as already pointed out, it has become the leading steel interest through the acquisition of the Tennessee Coal, Iron and Railroad Company. In practically every important iron and steel district east of the Mississippi River, therefore, with the single exception of the Atlantic seaboard, the Steel Corporation is the leading factor.[1] It is worth noting in this connection that the Steel Corporation has within a comparatively recent date acquired some iron-ore property in Cuba. Whether this foreshadows the erection by the Corporation of steel works on the Atlantic coast can only be surmised.

This distribution of the Steel Corporation's plants obviously gives it a very important advantage with respect to transportation costs, both for raw materials and for finished products, while there naturally are further advantages arising from proximity to consuming markets. These advantages may easily be exaggerated, but it can not be doubted that the location of the Steel Corporation's plants at strategic points over so large an area must carry with it advantages of no small significance.

Section 4. Position of the Steel Corporation from the standpoint of transportation.

With respect to railroad transportation the Steel Corporation practically has the field to itself, so far as steel makers are concerned, no one of its competitors having railroad properties of sufficient consequence to call for special mention. The railroad properties of the Steel Corporation, on the other hand, are of great importance. Indeed the profits derived by the Steel Corporation from its transportation properties, these profits coming chiefly from its railroad lines, represent a very substantial fraction of the entire net earnings. It will be remembered that the Steel Corporation has the two most important ore roads in the Lake Superior region, the Duluth and Iron Range and the Duluth, Missabe and Northern. The rates on ore are undoubtedly excessive, thus not only contributing large revenue to the Steel Corporation, but at the same time imposing a burden upon such of its competitors as are forced to ship their ore over these roads.

The earnings of these two railroads have been extraordinary. The great bulk of their freight traffic is in the transportation of ore. The cost of ore transportation (not the freight rates) from the Minnesota ranges to Lake Superior has greatly declined in recent years, and the ratio of operating expenses to gross earnings is extremely low for both roads. That for the Duluth, Missabe and Northern, in 1910, was below 30 per cent, as against an average for all railroads in the country of 66 per cent, while that for the Duluth and Iron Range, in 1910, was only 36.5 per cent. Freight rates, on the other hand, have been maintained at the same point at which they were established prior to the formation of the Steel Corporation. They average about 1 cent per ton-mile, which is undoubtedly excessive. As a result of these high freight rates and extraordinarily low operating expenses, these ore roads have been immensely profitable. The following table shows the dividends paid for a series of years.

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[1] In May, 1911, the Corporation purchased the Risdon Iron Works of San Francisco. This property, however, is used chiefly for warehousing purposes.

TABLE 54.—DIVIDENDS PAID BY STEEL CORPORATION'S ORE RAILROADS SINCE 1904.

Year ended June 30—	Duluth and Iron Range R. R.		Duluth, Missabe and Northern Ry.	
	Capital stock.	Rate.	Capital stock.	Rate.
		Per cent.		*Per cent.*
1904	$3,000,000	150	$2,512,500	150
1905	3,000,000	....	2,512,500	....
1906	3,000,000	105	4,112,500	[1] 102¾
1907	3,000,000	....	4,112,500	....
1908	3,000,000	120	4,112,500	110
1909	3,000,000	145	4,112,500	145
1910	3,000,000	100	4,112,500	240

[1] This was paid on $3,312,500 of stock, not on the full amount outstanding at the close of the year.

It should be pointed out that the amounts of capital stock issued by these companies upon which these rates of dividends are computed are comparatively small and undoubtedly considerably understate the investment in these roads in excess of the bonded indebtedness. As shown in Chapter III, there is good reason to believe that the capitalization of both these roads, in 1901, was fully covered by tangible property. The capital stock of the Duluth and Iron Range has not been changed since that date, and that of the Duluth, Missabe and Northern has been increased by only $1,600,000, whereas the investment in this property has been constantly increasing. Therefore, while these rates of dividends are by no means a fair indication of the rate upon the equity in the property represented by the capital stock, nevertheless these rates of dividends do mean that these two roads have been extraordinarily profitable.

Through the ownership of the Elgin, Joliet and Eastern Railway, and more particularly of the Bessemer and Lake Erie, the Steel Corporation has a further important advantage over its competitors with respect to transportation, as will be more clearly brought out in a subsequent part of this report. The minor railroad properties of the Corporation, also, particularly the Union Railroad of Pittsburg, the Chicago, Lake Shore and Eastern Railway, in the Chicago district, and the Connellsville and Monongahela Railway, in the Connellsville coal region, are important factors in its transportation system.

However, with respect to the transportation of finished products the Corporation, like its competitors, is chiefly dependent upon outside railroad systems, its own railroad lines covering such an insignificant fraction of the country as to be of comparatively minor importance in the transportation of finished steel products, although the possession of such railroad facilities even in this respect undoubtedly carries with it distinct advantages.

With respect to ore transportation on the Great Lakes, the Steel Corporation has a less commanding position. The Corporation transports only about two-thirds of its ore by Lake in its own boats, relying on outside vessel tonnage for the transportation of the remaining substantial fraction of its ore requirements.

Section 5. Position of the Steel Corporation with respect to ownership of coal and coke property.

At its organization the United States Steel Corporation controlled the great bulk of the choicest coking-coal lands in the Connellsville region, so that it had a very great advantage over its competitors in this respect. It has steadily added to its large holdings of coal and coke property. According to an affidavit of Thomas Lynch, president of the H. C. Frick Coke Company, in the Hodge suit, referred to in Chapter III, there were "less than 15,000 acres of unmined coal in the entire Connellsville basin outside of the holdings of the subsidiary companies of the United States Steel Corporation." Officials of the Steel Corporation have always placed great importance upon the value of their coal and coke property. Mr. Lynch in the affidavit just cited said:

> The value of the coal and coke properties above enumerated * * * is practically incalculable for the reason that in my opinion it would be impossible to replace these properties or to secure an adequate supply of coal and coke at anything like the present cost.

The above opinion, as previously noted, was probably influenced by the fact that the Steel Corporation was trying to justify its huge capitalization. Moreover, the subsequent development of new processes of making blast-furnace coke from various kinds of coal has somewhat modified the advantage of the Steel Corporation in the coke business. so that while the Corporation still maintains a decidedly advantageous position because of the exceptional coking quality of the Connellsville coal it can not be said to have a monopoly or even a monopolistic position in this branch of the steel industry.

As already stated on page 264, the Steel Corporation in 1911 made a very important acquisition of coking-coal properties from the Pittsburgh Coal Company, thereby still further strengthening its control of the most desirable coking-coal lands of the country. Therefore, while its position in the coking-coal business is by no means monopolistic, it should be kept in mind that the Corporation has secured control of a vast amount of coking-coal lands.

Section 6. Commanding position of Steel Corporation with respect to the ownership of iron ore.

From the preceding discussion it is apparent that the United States Steel Corporation does not have any monopoly of the production of iron and steel. Indeed, with respect to production alone, it hardly can be said to have, as a whole, a monopolistic position. Obviously a concern which, on the whole, produces over one-half of the country's steel output has a commanding position in the industry, overshadowing any individual competitor. On the other hand, the mere fact that over 50 per cent of the country's production of pig iron and nearly 50 per cent of the crude steel are manufactured by independents shows that there is substantial opportunity at the present time for independent production, even though competition has been regulated to a greater or less degree by understandings among producers.

In the railroad transportation of ore, it is true, the Steel Corporation has a position which in certain districts may fairly be designated as of a monopolistic character, and which undoubtedly contributes greatly to its strength in the industry. Nevertheless, it does not have a complete monopoly of ore transportation, even in the Lake region. In the old ranges of Michigan it has no railroads of its own, while in the Minnesota district there is one important outside road, the Eastern Railway of Minnesota, a branch of the Great Northern. Although the possession of its ore roads confers very great advantages upon the Corporation, it is obvious from the statistics presented that this has not prevented competition in the steel industry. Moreover, it has not prevented an increase in the production of the independents.

With respect to coking coal, the Steel Corporation has a decided advantage over all its competitors on account of its substantial monopoly of the famous Connellsville deposit, in western Pennsylvania. However, the fact that other coals can be commercially used for steel-making purposes in competition with the Connellsville product means, particularly in view of the almost unlimited supply of such grades of coal, that the Corporation in no sense has a monopoly of the coke branch of the steel industry.

So far as the Corporation has a monopolistic position in the steel industry, therefore, it rests chiefly on the one remaining branch, iron ore. As a matter of fact, the Steel Corporation does occupy a position in the iron-ore industry, which, while by no means constituting a monopoly, is clearly indicative of a monopolistic influence.

It is exceedingly difficult to make an accurate statement of the Corporation's position in the iron-ore industry from the standpoint of ownership. Obviously the full extent of any hidden natural resource can not be known. It is significant in this connection that the history of the industry shows that the great ore deposits of the country have almost invariably been greatly underestimated, while predictions that all the important deposits of the country have been discovered have almost yearly been disproved. An illustration of this is the recent discovery in the Baraboo district of southern Wisconsin of a tract of only comparatively small area for which the ore deposit is estimated at several hundred millions of tons, the ore, however, apparently being of rather low grade. Again, in the old range districts of Michigan extensive new deposits have been discovered in the past few years on territory which has long been under active development and extensively prospected. It would be absurd, therefore, to assume that the known deposits of ore in the country furnish a fixed denominator by which to measure the relative importance of the Steel Corporation.

An extremely important consideration in this connection is that iron ore of low grade occurs over enormous areas and in enormous quantities throughout the United States. A vast amount of such ore is of such low iron content, however, as to be out of consideration in any discussion of immediately available ore reserves. It is necessary, therefore, in discussing the proportion of the total ore reserves of the country controlled by the Corporation to confine comparisons to what may be termed commercially available ores at the present time. The Steel Corporation's holdings of such ores greatly exceed those of all other iron and steel interests combined.

It should be clearly understood that the ores of the Lake Superior region substantially form the basis of the steel production of the country. While the Steel Corporation has very extensive holdings of ore elsewhere, the great bulk of its ore holdings is in the Lake Superior district.

One of the best indications of the position of the Steel Corporation in the Lake region is found in a report of the Minnesota Tax Commission for 1908, which, after a very careful listing of the iron-ore mines of the State and estimate of their tonnage (evidently on a conservative basis), placed the grand total tonnage and that of the United States Steel Corporation in 1907 in round numbers as follows:

Grand total, all concerns in Minnesota ... tons	1,192,000,000
United States Steel Corporation (Oliver Iron Mining Company) ... tons	913,000,000
Per cent Steel Corporation (computed by Bureau)	76.6

While this estimate covered the State of Minnesota only, in view of the fact that prior to the recent acquisitions in the Baraboo district of Wisconsin over 80 per cent of the Steel Corporation's ore reserves, excluding the Hill holdings, were in Minnesota, it will be seen that these figures give a fairly complete idea of the position of the Steel Corporation in this respect. Including the Hill ores, it is probable that over 90 per cent of the Steel Corporation's known supply of Lake ore at the close of 1907 was in the State of Minnesota.

In this connection it may be noted that the secretary of the Minnesota Tax Commission, in a letter to the Commissioner of Corporations dated May 12, 1909, said:

> They [the United States Steel Corporation] now control at least 80 per cent of the present known tonnage in the State.

In the old ranges of Michigan the Corporation probably has a somewhat smaller proportion of the total ore deposits. However, its proportion on the Michigan ranges is large.

A further indication of the proportion of the total amount of ore in the Lake Superior region, controlled by the United States Steel Corporation, is furnished by data submitted to the Finance Committee of the United States Senate in 1909, by Joseph G. Butler, jr., of the Brier Hill Iron and Coal Company, and head of the Bessemer Pig Iron Association. Mr. Butler's evidence included, among other data, a report from John Birkinbine, a mining engineer of Philadelphia, and also certain statistics furnished by the Steel Corporation itself.

The Steel Corporation's estimate of its iron ore reserves thus furnished Mr. Butler follows:

	Ores of present standard commercially.	Silicious and other low-grade ores.	Total.
	Gr. tons.	*Gr. tons.*	*Gr. tons.*
Northern ores	1,258,289,000	365,845,000	1,624,134,000
Southern ores	459,300,000	239,000,000	698,300,000
Total	1,717,589,000	604,845,000	2,322,434,000

Mr. Butler placed the total amount of commercially available ore in the United States at that time at 4,462,940,000 tons, as follows:

	Tons.
Lake Superior region	1,618,000,000
New York	750,000,000
New Jersey	135,000,000
Pennsylvania	45,000,000
South	1,814,940,000
Rocky Mountain district	100,000,000
Total	4,462,940,000

Applying the Corporation's estimate of its total commercially available tonnage in all parts of the country, namely, 1,717,589,000 tons, to his estimated total, Mr. Butler arrived at the conclusion that the Steel Corporation then owned 38½ per cent of the available or desirable ores of the country.

As already made clear, however, such comparisons—disregarding for the moment the question whether Mr. Butler's total can be accepted—are of little significance because of the fact that the steel industry is essentially based upon the ores of the Lake Superior district. In this connection it may be noted that Mr. Birkinbine, the engineer above referred to, reported to Mr. Butler, after reviewing numerous estimates of the probable extent of the deposit of the Lake Superior region, "that an estimate of 1,600,000,000 tons of reserves in the Lake Superior region was conservative." Mr. Birkinbine, however, went on to say:

> But the remarkable economies which have been achieved in mining, handling and transporting ore in large quantities, the advances in beneficiating processes, the problems in the near future of the material expansion of the iron-producing industry in the upper Lake region, may bring many ores not now considered available in the shipping list, thus greatly augmenting the reserves. * * *

Taking the estimate of 1,600,000,000 tons for the total commercially available ore of the Lake Superior region at that particular time, the Steel Corporation's estimate of 1,258,289,000 tons for its holdings would be equivalent to well over 75 per cent of this total. Of course, the ideas of the consulting engineer and those of the Steel Corporation's experts as to what were commercially available ores may have differed somewhat, but it is not likely that the proportion of ore controlled by the Steel Corporation as shown by these two estimates is too high, because both of these statements were submitted by Mr. Butler together with extensive data for other ore supplies in the United States for the avowed purpose of proving that the proportion of the ore supply controlled by the Steel Corporation was less than 85 per cent of the total supply.

In 1908 the commercially available ore of the Lake Superior region was computed by the United States Geological Survey, for the Conservation Commission, at 3,500,000,000 tons, but the iron content assumed as a basis for available ore was very much lower than in the two preceding estimates, thus greatly increasing the total quantity. This and other evidence indicates that the Survey estimate is not fairly comparable with that of the Corporation.

At the beginning of 1908 the United States Steel Corporation estimated its total ore reserves in the Lake Superior region, not including the very extensive deposits covered by the so-called Hill lease, at approximately 1,200,000,000 tons. This estimate was largely based upon very careful prospecting operations, a very large proportion of the Steel Corporation's ore lands in the Lake Superior region having been very thoroughly drilled upon, with careful records of depths, analyses, etc. Adding 300,000,000 tons as a conservative estimate for the tonnage covered by the Hill lease would give the Corporation control in the ore ranges of Minnesota and Michigan of 1,500,000,000 tons. In the South, as already shown, the Corporation has a reserve tonnage which may fairly be placed at not less than 500,000,000 tons.

In these three districts, therefore, the present tonnage of the Steel Corporation which may be considered as a fairly definitely known or developed tonnage, is not less than 2,000,000,000 tons. Including its holdings in the Baraboo district and some miscellaneous holdings the total ore of the Corporation may be conservatively estimated at not less than 2,500,000,000 tons.

Many facts point to a policy on the part of the Steel Corporation of securing control of the ore deposits of the country far in advance of its immediate needs. As clearly brought out in Chapter V, the most logical explanation of the Hill lease with its extraordinary royalty and other onerous conditions is that the Corporation desired to prevent these ores from coming into the hands of competitors. The acquisition of the Tennessee Coal, Iron and Railroad Company likewise apparently was desirable more on account of the enormous ore and coal reserves of the company than because of its manufacturing plants, although these ores at present have a low value. Furthermore, the Corporation has examined a large amount of ore territory under option and has added greatly to its holdings of ore in consequence, notably in the case of the Baraboo district. The Corporation also secured a deposit of ore in Cuba, estimated to contain fully 60,000,000 tons. At one time the Corporation held extensive options on ore lands on the Cuyuna Range in Minnesota and also in Canada, but it is stated that many of these options proved to contain little ore and were given up.

These various acquisitions certainly indicate a rather definite policy on the part of the Corporation to increase its control of the ore reserves of the country. In this connection, it may be noted that E. H. Gary, chairman of the Steel Corporation, in testimony before the Ways and Means Committee in 1908, admitted that the Corporation had control of the ultimate ore supply of the entire country, as the following excerpt will show:

> Mr. COCKRAN. You practically do control the ore supply of the country?
>
> Mr. GARY. No; not now; not for the immediate future.
>
> Mr. COCKRAN. Well, the ultimate supply?
>
> Mr. GARY. Yes; I think so—that is, pretty nearly. It is not absolute control.

Recently Mr. Gary substantially modified and in part withdrew this statement.

The system of leasing ore mines, as employed in the Lake region, is important in this connection. A very large part (approximately two-thirds in 1910) of the Corporation's total holdings in the Lake region is held by lease. Frequently there is no initial investment in such leaseholds, and even where a bonus is paid it is usually small, while the minimum tonnage on which royalty must be paid, whether mining operations are conducted or not, is generally unimportant. The Hill lease is, of course, as above shown, a very marked exception in the last respect.

It will be seen, therefore, that this ore-leasing system, where there is no limit placed on the number of leases that can be combined under a single interest, greatly facilitates the gathering in by a great concern like the Steel Corporation of a vast amount of ore reserves, far in advance of any commercial need for them. This not only prevents others from getting such property but also secures to such a concern the benefit of any appreciation in value which may come about either from natural causes or as a result of this very concentration of ownership. Obviously, a system which thus lends itself to such marked concentration of ore property for many years in advance (a common term of lease being fifty years), at a comparatively small cost, involves questions of the highest public importance. It might be said that the lease system as thus applied in the Lake ore region really affords an opportunity for a wealthy interest to attempt a corner in ore reserves on what is, in effect, a margin basis.

Of course, in such extensive acquisitions there is a decided speculative risk, just as in similar efforts to control commodity markets, particularly the possibility of the discovery of available deposits elsewhere, or new methods of mining which may render available what are now nonavailable ores for present commercial purposes. Taking conditions as they are to-day, however, there can be no doubt that the Steel Corporation has control of the great bulk of the commercially available ores of the Lake Superior district, its proportion probably being about three-fourths of the total. This dominating position in the ore industry enjoyed by the Steel Corporation through this great ownership of ore reserves is heightened because of its very marked degree of control of the transportation of ore in the Lake Superior district.

EXHIBITS.

EXHIBIT 1.

UNDERWRITING AGREEMENT OF MARCH 1, 1901, BETWEEN J. P. MORGAN & CO. AND THE UNITED STATES STEEL CORPORATION.

An agreement, made this first day of March, nineteen hundred and one, by and between United States Steel Corporation, a corporation existing under the laws of the State of New Jersey (hereinafter called the "Steel Company"), party of the first part, and J. P. Morgan & Co., of the city of New York, acting in behalf of a Syndicate, party of the second part:

Whereas, the Steel Company has been organized with a capital of $3,000, of which one-half is 7% cumulative preferred stock and one-half is common stock, as shown by the certificate of incorporation of the Steel Company, recorded in Hudson County, New Jersey, on the 25th day of February, 1901, which capital stock is to be increased as hereinafter provided; and

Whereas, as hereinafter stated, the board of directors of the Steel Company deem it necessary for its business now to acquire the stocks and bonds of certain other corporations and also to obtain for its corporate purposes a certain sum in cash; and

Whereas, after careful investigation and appraisement, the board of directors of the Steel Company has ascertained, adjudged and determined that the value of such bonds and stocks now so to be acquired and hereinafter specified, exclusive of such cash sum (which cash sum is to be received and treated by the Steel Company as surplus), is equal at least to the par value of the stock of the Steel Company and of the bonds of the Steel Company to be issued therefor; and

Whereas, the board of directors of the Steel Company considers that such bonds, stocks and cash may best be obtained by purchase, on the terms hereinafter stated, from the Syndicate represented by Messrs. J. P. Morgan & Co., party of the second part hereto, and managers of the said Syndicate; and

Whereas, each of the corporations, the capital stock of which it is proposed now to acquire hereunder, has been organized and now is existing under the laws of the State of New Jersey, and has outstanding capital stock divided into shares each of the par value of $100 (excepting the Carnegie Company, of which the capital stock is divided into shares of the par value of $1,000), and divided, also, into classes as next hereinafter stated, the said corporations, and the total outstanding capital stock and the classes thereof, being as follows, to wit:

Name of corporation.	Total outstanding capital stock.	
	Preferred.	Common.
American Sheet Steel Company	$24,500,000	$24,500,000
American Steel Hoop Company	14,000,000	19,000,000
American Steel and Wire Company	40,000,000	50,000,000
American Tin Plate Company	18,325,000	28,000,000
Carnegie Company		160,000,000
Federal Steel Company	53,260,900	46,484,300
National Steel Company	27,000,000	32,000,000
National Tube Company	40,000,000	40,000,000

And whereas, the Carnegie Company has issued, and there are now outstanding, its 5% bonds for the aggregate principal sum of $160,000,000: and

Whereas, the Syndicate has arranged for the acquisition of substantially all of the bonds and the stock of the Carnegie Company; and

Whereas, in reliance upon this contract the Syndicate is endeavoring to effect the acquisition, and the delivery of all of the bonds of the Carnegie Company, and all of the outstanding shares of the capital stock of all of said corporations, upon the terms herein provided.

Now, therefore, in consideration of the premises and of other good and valuable considerations, and of the efforts and expenses which both parties recognize will have to be made and incurred by the Syndicate in their endeavor to consummate such sale:

First. The Steel Company agrees with J. P. Morgan & Co., acting in behalf of the Syndicate, as follows:

(1) If, on or before May 31, 1901, J. P. Morgan & Co. in behalf of the Syndicate shall

(*a*) Sell and deliver, or cause to be sold and delivered, to the Steel Company, at least fifty-one per cent of such outstanding shares of the capital stock of each of the corporations above named, or of such of said corporations as finally shall be embraced within the operation of this agreement with the approval of the Steel Company, which fifty-one per cent of the total outstanding capital stock of each of such corporations shall include not less than fifty-one per cent of the total outstanding preferred stock, if any, of such company; and also all of the $160,000,000 of bonds of the Carnegie Company now outstanding, or such lesser amount thereof as shall be tendered by J. P. Morgan & Co.; and

(*b*) Shall pay, or shall cause to be paid, to the Steel Company twenty-five million dollars in cash:

(2) The Steel Company will purchase such shares and bonds, and, in payment and consideration for such stock and bonds and for such cash, will issue to such persons as J. P. Morgan & Co., in behalf of the Syndicate, shall indicate, shares of its preferred stock and shares of its common stock (all of which shall be fully paid and non-assessable), and also its five per cent gold bonds (which bonds shall be

of such form and tenor, and shall be secured, as J. P. Morgan & Co. may determine), as follows:

(*a*) In the event that the Steel Company shall acquire all the shares of the capital stock of all of such other corporations and all such bonds of the Carnegie Company, the Steel Company will issue for all such stock, and such bonds, and such sum in cash, four million two hundred and forty-nine thousand nine hundred and eighty-five shares of its preferred stock, and four million two hundred and forty-nine thousand nine hundred and eighty-five shares of its common stock, and also three hundred and four million dollars of its said five per cent gold bonds.

(*b*) In the event that the Steel Company shall not acquire all the shares of the capital stock of all of such other corporations and all such bonds of the Carnegie Company, the Steel Company will issue for the shares of stock and the bonds which shall be acquired, and said sum in cash, four million two hundred and forty-nine thousand nine hundred and eighty-five (4,249,985) shares of its preferred stock, and four million two hundred and forty-nine thousand nine hundred and eighty-five (4,249,985) shares of its common stock, and three hundred and four million dollars ($304,000,000) of its five per cent gold bonds, less abatement and deduction therefrom to be made as follows:

For each $100 par value of stock of such other companies mentioned in the following table, which shall not be acquired by the Steel Company, the amount of the preferred stock and common stock, or either, set opposite to such class of stock in said table shall be deducted and abated.

Name of company and class of stock.	Amount of stock to be deducted in par value.		Name of company and class of stock.	Amount of stock to be deducted in par value.	
	Preferred stock.	Common stock.		Preferred stock.	Common stock.
Carnegie Company	$150.00	$150.00	American Tin Plate Co.:		
Federal Steel Co.:			Preferred stock	$125.00	....
Preferred stock	110.00	....	Common stock	20.00	$125.00
Common stock	4.00	107.50	American Steel Hoop Co.:		
American Steel and Wire Co. of N. J.:			Preferred stock	100.00	....
Preferred stock	117.50	....	Common stock	....	100.00
Common stock	....	102.50	American Sheet Steel Co.:		
National Tube Co.:			Preferred stock	100.00	....
Preferred stock	125.00	....	Common stock	....	100.00
Common stock	8.80	125.00			
National Steel Co.:					
Preferred stock	125.00	....			
Common stock	....	125.00			

For each $1,000 par value of such bonds of the Carnegie Company that shall not be acquired by the Steel Company $1,000 par value of such bonds of the Steel Company shall be abated and deducted.

Second. The Steel Company further agrees that in the event of the acquisition by it pursuant to this agreement of less than the total issue of said bonds of the Carnegie Company or less than the total outstanding capital stock of each of said corporations, the Steel Company from time to time will purchase from such persons as shall be indicated by J. P. Morgan & Co., any and all additional outstanding bonds of the Carnegie Company or shares of the capital stock of any of said corporations that shall be tendered to the Steel Company prior to May 1, 1902; and in payment therefor will issue and deliver its bonds and fully paid-up shares of its preferred stock and fully paid-up shares of its common stock, at the rates at which deduction and abatement shall have been made under Article First hereof in respect of the additional bonds and shares of stock so purchased.

Third. The Steel Company shall credit and allow to J. P. Morgan & Co. on account of the cash sum payable under Article First hereof, or shall pay to J. P. Morgan & Co. a sum equal to the aggregate amount which, prior to April 1, 1901, shall have accrued upon any installments of dividends accruing, but not matured, on any such preferred stock at the date of delivery thereof to the Steel Company.

The Steel Company further agrees that the dividends on all the preferred stock of the Steel Company to be issued by it hereunder, shall begin to accrue from April 1, 1901.

Fourth. The Steel Company, without prejudice to the further exercise of its chartered rights to increase or to decrease its capital stock, agrees that it will lawfully increase its authorized capital stock to an amount sufficient to enable it to issue and to deliver its preferred stock and its common stock to the aggregate amount hereinbefore provided.

Fifth. J. P. Morgan & Co., in behalf of the Syndicate, will bear and will pay the statutory fees and taxes for the proposed increase of the capital stock of the Steel Company.

Sixth. This agreement, and any agreement in pursuance thereof, is and shall be strictly *inter partes;* and no stockholder of any of the corporations above referred to shall be deemed to have any right hereunder.

In witness whereof, these presents have been duly executed by the parties hereto the day and year first above written.

UNITED STATES STEEL CORPORATION,
[L. S.] By W. J. CURTIS, *President.*
Attest:
CHARLES MAC VEAGH,
Secretary, J. P. Morgan & Co.

EXHIBIT 2.

UNDERWRITING AGREEMENT OF APRIL 1, 1901, BETWEEN J. P. MORGAN & CO. AND THE UNITED STATES STEEL CORPORATION.

An agreement, made this 1st day of April, nineteen hundred and one, by and between United States Steel Corporation, a corporation existing under the laws of the State of New Jersey (hereinafter called the "Steel Company"), party of the first part, and J. P. Morgan & Co., of the city of New York, parties of the second part:

Whereas, the Steel Company has been organized with a capital stock of $3,000, of which one-half is 7 per cent cumulative preferred stock and one-half is common stock, as shown by the certificate of incorporation of the Steel Company, recorded in Hudson County, New Jersey, on the 25th day of February, 1901, which capital stock is to be increased as provided in a certain agreement dated March 1, 1901, between the Steel Company and J. P. Morgan & Co., acting in behalf of a Syndicate; and

Whereas, the board of directors of the Steel Company deem it necessary for its business now to acquire the stocks of the other corporations hereinafter named, and, after careful investigation and appraisement, the board of directors of the Steel Company has ascertained, adjudged and determined that the value of such stocks now so to be acquired and hereinafter specified, is equal at least to the par value of the stocks of the Steel Company together with the sums in cash to be issued and paid therefor as hereinafter provided; and

Whereas, the board of directors of the Steel Company considers that such stocks may best be obtained by purchase, on the terms hereinafter stated, through Messrs. J. P. Morgan & Co., parties of the second part hereto; and

Whereas, the names of said corporations and the classes and amounts of the capital stock thereof which the Steel Company desires to acquire are as follows:

The Lake Superior Consolidated Iron Mines (a corporation of New Jersey) 298,884—4897/10000 shares, of the aggregate par value of $29,888,448.97.

Bessemer Steamship Company (a corporation of West Virginia) 50,000 shares of the aggregate par value of $5,000,000.

American Bridge Company (a corporation of New Jersey) 313,738 shares of preferred stock, of the aggregate par value of $31,373,800, and 309,508 shares of common stock, of the aggregate par value of $30,950,800.

Colorado Fuel and Iron Company (a corporation of Colorado) 20,000 shares of preferred stock, of the aggregate par value of $2,000,000, and 170,000 shares of common stock, of the aggregate par value of $17,000,000.

Oliver Iron Mining Company (a corporation of Minnesota) 2,000 shares, of the aggregate par value of $200,000, out of a total capital stock of $1,200,000.

Pittsburgh Steamship Company (a corporation of West Virginia), 2,217 shares, of the aggregate par value of $221,700, out of a total outstanding capital stock of $1,333,000.

And whereas, J. P. Morgan & Co. have heretofore rendered services for the purpose of acquiring such stocks of said several companies for the benefit of the Steel Company, and the Steel Company desires that J. P. Morgan & Co. shall render further services for the purpose of acquiring such stocks:

Now, therefore, in consideration of the premises and of other good and valuable considerations, and of the efforts and expenses which both parties recognize, will have to be made and incurred by Messrs. J. P. Morgan & Co. under this agreement:

First. The Steel Company agrees with J. P. Morgan & Co. as follows:

(1) If on or before May 31st, 1901, J. P. Morgan & Co. shall procure the sale and delivery to the Steel Company of all, or any part, not less than fifty-one per cent, of such outstanding shares of the capital stock of said Lake Superior Consolidated Iron Mines, the Steel Company will purchase such shares, and in payment and con-

sideration therefor will issue to the respective vendors thereof, or for their account, as may be directed by J. P. Morgan & Co., $135 in the preferred stock and $135 in the common stock of the Steel Company (all of which shall be fully paid and non-assessable) for each $100 par value of such shares of the capital stock of said Lake Superior Consolidated Iron Mines so sold and delivered to the Steel Company.

Such stock of said Lake Superior Consolidated Iron Mines must carry all dividends and rights to dividends declared or payable after March 15, 1901. Dividends on the preferred stock of the Steel Company to be issued in part payment therefor shall begin to accrue from April 1st, 1901.

(2) If on or before May 31st, 1901, J. P. Morgan & Co. shall procure the sale and delivery to the Steel Company, or an agreement for the sale and delivery to the Steel Company, of all the shares of the capital stock of said Bessemer Steamship Company, the Steel Company will purchase such shares of stock and will agree to pay therefor the sum of $8,500,000 in cash on or before May 1, 1902, with interest from May 1, 1901, at the rate of five per cent per annum.

Such stock of the Bessemer Steamship Co. must carry all dividends and rights to dividends declared or payable after March 15, 1901.

(3) If on or before May 31st, 1901, J. P. Morgan & Co., shall procure the sale and delivery to the Steel Company of said shares of the capital stock of said Oliver Iron Mining Company, of the aggregate par value of $200,000, together with said shares of the capital stock of said Pittsburgh Steamship Company of the aggregate par value of $221,700, the Steel Company will purchase such shares and, in payment and consideration therefor will issue to the vendors thereof, or for their account, as may be directed by J. P. Morgan & Co., 92,500 shares of its preferred stock of the aggregate par value of $9,250,000 and 92,500 shares of its common stock of the aggregate par value of $9,250,000, all of which shall be fully paid and non-assessable.

Such shares of stock of the Oliver Iron Mining Company must carry all dividends and rights to dividends declared or payable after March 27th, 1901; and dividends on the preferred stock of the Steel Company to be issued in part payment therefor shall begin to accrue from April 1st, 1901.

(4) If on or before May 31st, 1901, J. P. Morgan & Co. shall procure the sale and delivery to the Steel Company of all, or any part not less than fifty-one per cent, of said total outstanding capital stock of the American Bridge Company (which fifty-one per cent of the total outstanding capital stock shall include not less than fifty-one per cent of the total outstanding preferred stock of said American Bridge Company), the Steel Company will purchase such shares, and in payment and consideration therefor will issue to the vendors thereof, or for their account as may be directed by J. P. Morgan & Co., shares of the preferred stock and common stock of the Steel Company (all of which shall be fully paid and non-assessable) at the following rates:

For each $100 share of the preferred stock of the American Bridge Company sold and delivered to the Steel Company, $110 par value in the preferred stock of the Steel Company.

For each $100 share of the common stock of the American Bridge Company sold and delivered to the Steel Company, $105 par value in the common stock of the Steel Company.

Such preferred stock of the American Bridge Company shall not carry the dividend of 1¾ per cent declared payable thereon April 24, 1901, but must carry all other dividends and rights to dividends declared or payable after April 1st, 1901; and such common stock of the American Bridge Company must carry all dividends and rights to dividends declared or payable after March 15th, 1901. Dividends on the preferred stock of the Steel Company to be issued for such preferred stock of the American Bridge Company shall begin to accrue from April 1st, 1901.

(5) The Steel Company hereby authorizes and requests J. P. Morgan & Co., for account of the Steel Company, to purchase or acquire, or to contract for the purchase or acquisition of, all or any of the outstanding shares of the capital stock of the Colorado Fuel & Iron Company, in consideration of the issue by the Steel Company in payment therefor of such amount of the preferred stock and common stock of the Steel Company as, from time to time, may be fixed by J. P. Morgan & Co., not exceeding in the aggregate $15,000,000 in the preferred stock and $15,000,000 in the common stock of the Steel Company in case all said outstanding 19,000 [190,000] shares of the Colorado Fuel & Iron Company shall be so purchased or acquired, and not exceeding a proportionate amount of such preferred stock and of such common stock of the Steel Company for any number less than all of such outstanding 19,000 [190,000] shares that may be so purchased or acquired.

(6) The Steel Company requests J. P. Morgan & Co. to endeavor to procure the sale and delivery to it on said terms of such shares of capital stock of said several corporations or any of them, and hereby it authorizes J. P. Morgan & Co., in their own name, or otherwise, by public notice or otherwise, to offer to the several stockholders of said several corporations, or any of them, in exchange for stocks in said corporations, respectively, certificates for preferred stock and common stock of the Steel Company on the terms aforesaid. Any such offer may require the deposit of such stocks with J. P. Morgan & Co. as depositaries, or with any other depositaries designated by them, and may be made subject to any other further terms and conditions that may be prescribed by J. P. Morgan & Co.

The Steel Company will increase its capital stock to such amount as may be required for the purpose of making the purchases hereby authorized.

(7) The Steel Company authorizes and requests J. P. Morgan & Co. to make all agreements, and to do all acts and things, and to make any expenditures which, in their sole discretion, they may deem expedient for the purpose of acquiring such shares of stock, or any of them as aforesaid; and the Steel Company agrees to reimburse J. P. Morgan & Co. for all such expenditures and to pay all other expenses of any description made or incurred by J. P. Morgan & Co. in acting hereunder. The Steel Company further agrees to pay to J. P. Morgan & Co. fair compensation for their services hereunder.

Second. J. P. Morgan & Co. agree to endeavor to procure the sale and delivery to the Steel Company, on the terms aforesaid, of said stocks of said several corporations, and they agree to include in any sale of stocks of the American Bridge Company all of the shares of the common stock and preferred stock of said company by them owned. J. P. Morgan & Co. further agree that they will make an offer to the stockholders of the American Bridge Company, and of the Lake Superior Consolidated Iron Mines, inviting them to receive in exchange for their stocks, certificates for preferred stock and common stock of the Steel Company on the terms aforesaid.

In witness whereof, these presents have been duly executed by the parties hereto the day and year first above written.

UNITED STATES STEEL CORPORATION.
By ——— ———, *President.*

Attest:
——— ———, *Secretary.*

EXHIBIT 3.

SYNDICATE AGREEMENT OF FEBRUARY 26, 1901, BETWEEN J. P. MORGAN & CO. AND THE SYNDICATE SUBSCRIBERS RELATIVE TO ORGANIZATION OF THE UNITED STATES STEEL CORPORATION.

An agreement, made as of the 26th day of February, nineteen hundred and one, by and between J. P. Morgan & Co., of the city of New York, parties of the first part, and the subscribers hereto (hereinafter called severally the "Subscribers" and collectively the "Syndicate"), severally, parties of the second part:

Whereas, the United States Steel Corporation has been organized under the laws of the State of New Jersey, with a capital stock of $3,000, of which one-half is seven per cent cumulative preferred stock and one-half is common stock, which capital stock presently is to be increased to such amount as shall be approved by J. P. Morgan & Co., and such corporation (hereinafter called the "Steel Company") desires now to acquire, as hereinafter provided, stocks and bonds of all or of some of the several corporations next hereinafter referred to, and certain sums in cash; and

Whereas, J. P. Morgan & Co., acting in behalf of the Syndicate, are hereby authorized to enter, and now are about to enter, into a contract or contracts with the Steel Company, by which the Steel Company is to agree to issue to such persons as J. P. Morgan & Co. in behalf of the Syndicate shall indicate, shares of its preferred stock and shares of its common stock (all of which shall be fully paid and non-assessable) and also its five per cent gold bonds, in payment and in consideration for outstanding bonds of the Carnegie Company, and shares of the outstanding preferred stock and common stock of the following named companies, or some of them, as shall be agreed upon or be provided for in such contract or contracts:

American Sheet Steel Company,
American Steel Hoop Company,
American Steel and Wire Company of New Jersey,
American Tin Plate Company,
Carnegie Company,
Federal Steel Company,
National Steel Company,
National Tube Company.

Now, therefore, in consideration of the premises and of the mutual promises herein contained, J. P. Morgan & Co. and the Syndicate have mutually agreed as follows:

First. J. P. Morgan & Co. shall have power and authority from time to time, in such manner and on such terms as from time to time, either generally or in special cases, they may deem expedient:

(1) Publicly or otherwise to offer, or to agree to deliver, or to cause to be delivered, in such amounts and at such general or special rates as, from time to time, either generally or in special cases, they may deem expedient, shares of the preferred stock, and shares of the common stock, and bonds, of the Steel Company, in exchange for or in purchase of any of the stocks of any of the other companies named in said proposed contracts, that shall be delivered to J. P. Morgan & Co., or as they may direct; and

(2) By the use of any of the stocks, or of any of the bonds, of the Steel Company, deliverable under said proposed contracts, or of moneys provided or derived under the terms of this agreement, to acquire all or any of the stocks, or of the bonds, or both, of all or of any of the other companies above referred to.

Second. From time to time, upon calls made by J. P. Morgan & Co., and within such periods as shall be specified in such calls, the Subscribers, severally and respectively, will pay to J. P. Morgan & Co. such sums in cash, as shall be called by J. P. Morgan & Co., but in the aggregate, not exceeding their respective subscriptions hereunder.

Third. J. P. Morgan & Co., in the exercise of their absolute discretion, may use the sums in cash so received from the Subscribers, for all or any of the following purposes, viz:

(1) In payment to the Steel Company of any sum in cash by it to be received under said proposed contracts, and any further sums that may become payable to the Steel Company under any agreement modifying the same or supplemental thereto.

(2) For any expenditures which J. P. Morgan & Co. in their discretion may have incurred or hereafter may incur in or about the preparation or the performance of this agreement or of said proposed contracts, or for any purpose which, in their judgment, may tend to promote the objects of this agreement or the benefit of the Syndicate hereunder.

(3) In acquiring, by purchase or otherwise, as hereinbefore authorized by clause (2) of Article First of this agreement, any of the preferred stock and common stock and bonds of the companies hereinabove referred to.

All or any of such stocks and bonds of such other companies, so acquired by J. P. Morgan & Co., may be delivered by them under the terms of said proposed contracts to the Steel Company, in exchange for its stocks and bonds as therein provided; or, in their discretion, J. P. Morgan & Co. may re-sell to others all or any of such stocks and bonds.

Fourth. J. P. Morgan & Co. may retain all of said stocks of the Steel Company, to be received pursuant to said proposed contracts (except such of said stocks as by them shall be used or be set apart for use under Article First of this agreement) for such period as in their discretion they may deem expedient, not exceeding fifteen months from the date hereof; and, from time to time, during said period and at any time before final distribution hereunder, they may sell, all or any of such stocks, at public or private sale and at such prices, and on such terms as to credit or otherwise, as they may deem expedient.

Fifth. All such stocks of the Steel Company mentioned in Article Fourth hereof, and all net proceeds resulting from sales of any of such stocks or from any other transactions of J. P. Morgan & Co., for account of the Syndicate under any of the provisions hereof, shall be applied by J. P. Morgan & Co. as follows:

(1) First, to the payment of any and all expenses and obligations incurred by J. P. Morgan & Co. under any provision of this agreement.

(2) Secondly, in repayment to the Subscribers (so far as the same may be sufficient for that purpose) of all sums by them respectively paid to J. P. Morgan & Co. pursuant to Article Second; such repayment to be made to the Subscribers ratably.

(3) One-fifth of any residue of such stocks and net proceeds remaining after payment in full of all such sums payable under clauses (1) and (2) of this article shall be retained by, and shall belong to, J. P. Morgan & Co. for their own use, as compensation for their services in forming and managing the Syndicate: and the remaining four-fifths of such residue shall be distributed by J. P. Morgan & Co. among the Subscribers ratably according to their respective interests.

Such one-fifth of any such residue shall be the only compensation to be received by J. P. Morgan & Co. for their services in forming and managing the Syndicate; and, in case there shall be no such residue, J. P. Morgan & Co. shall not receive any compensation for their services in forming or in managing the Syndicate.

Any stocks or other assets comprised in such residue may be sold by J. P. Morgan & Co., or may be distributed by them as they may deem expedient.

Such application of such net proceeds and such distribution of such residue, may be made by J. P. Morgan & Co. from time to time when and as they may deem expedient.

All cash sums received by J. P. Morgan & Co. under any provision of this agreement shall be held by them as bankers.

Sixth. Until the expiration of such fifteen months, or until the final distribution hereunder, J. P. Morgan & Co. in such manner, at such prices, on such terms, and in such amounts, as they may deem expedient, shall have power, for account of the Syndicate, to make purchases of the bonds and of the preferred stock and of the common stock of the Steel Company, and they may resell any such bonds and stocks which they may have purchased; and, in their discretion, they may make any further undertakings of any kind with any persons concerning any such bonds and stocks. They may apply towards any such purchases any sums realized from any sales of bonds and stocks of the Steel Company under any provision of this agreement; and they may make advances, or may procure loans, and may secure the same to such amounts and in such manner as from time to time they may deem expedient for any of the purposes of this agreement.

Seventh. J. P. Morgan & Co. shall issue to the Subscribers suitable receipts in respect of payments made hereunder, and they may issue to the respective Subscribers certificates of interest, of such tenor and form as they may deem suitable. Such certificates of interest and all rights and obligations hereunder of the respective Subscribers may be made transferable in such manner and on such terms and conditions as J. P. Morgan & Co. may prescribe.

Eighth. J. P. Morgan & Co. shall have authority, from time to time and at any time, to incur such expenses as they may deem proper in carrying out, or in endeavoring to carry out, this agreement or said proposed contracts, or in doing any act or thing which they may deem to be in the interest of the Syndicate; and they shall have power and authority, in their sole and absolute discretion, finally to fix and to pay all compensations of depositaries, brokers, agents and counsel, or others; and in the expense account may be included brokers' commissions as usually paid.

Ninth. For account of the Syndicate, J. P. Morgan & Co., from time to time, may make undertakings of any kind with any persons concerning, or for the acquisition of, bonds or shares of either or of both of the classes of stock of any of the companies hereinabove referred to, and they may make purchases thereof from the holders thereof, or in any market or otherwise, and may sell the same at such prices, on such terms and in such amounts as from time to time they may deem expedient.

Tenth. On signing this agreement each Subscriber shall indicate opposite his name the total sum of his subscription on account of the whole Syndicate obligation hereunder; and the several Subscribers shall be called upon to make payments in respect of their several subscriptions only ratably according to the respective amounts thereof, but each Subscriber shall be so responsible to the full extent of his undertaking, regardless of performance or non-performance by any other Subscriber.

When and as requested by J. P. Morgan & Co., and without reference to the receipt or the possession hereunder by J. P. Morgan & Co., or by the Subscribers of any bonds or stock, each Subscriber will make any and all payments, and will perform all of his undertakings under this agreement, and will do all things which by J. P. Morgan & Co. shall be deemed desirable to aid in the accomplishment of the purposes of this agreement.

Nothing herein contained or otherwise shall constitute the parties hereto partners, or shall render any one of the Subscribers liable to contribute more than his several proportionate amount as herein provided, or shall prevent any of the parties from contracting with each other with reference to any of their respective interests.

Eleventh. In case of any failure of any Subscriber to make any payment called for, or to perform any of his undertakings hereunder, J. P. Morgan & Co. in their sole and exclusive discretion may exclude such Subscriber from all interest in the Syndicate; and in their discretion and in such manner as they may deem proper, without any proceeding, either at law or in equity, they may dispose of such Subscriber's participation hereunder or of any interest or right of such Subscriber hereunder or under said proposed contracts; but nevertheless such Subscriber in default shall be responsible to J. P. Morgan & Co., for the benefit of the other Subscribers hereto, for all damages caused by any failure on his part. At any public sale under this article of any interest or right of any Subscriber, J. P. Morgan & Co., or any party hereto, may become purchaser for their, or for his own, benefit, without accountability.

Twelfth. J. P. Morgan & Co. shall have full power, in their discretion, to agree with the Steel Company upon the terms and provisions of such proposed contracts, and as to the amount of the preferred stock and the common stock and bonds of the Steel Company to be issued and delivered under said proposed contracts; and, also, they shall have full power and authority, from time to time to enter into any agreements with the Steel Company modifying the said proposed contracts as they may deem expedient. Any and all contracts with the Steel Company made by J. P. Morgan & Co. in behalf of the Syndicate shall be open to inspection by any Subscriber at the office of J. P. Morgan & Co.

Thirteenth. J. P. Morgan & Co. shall be the sole and final judges as to whether at any time it is to the interest of the Syndicate to proceed further under this agreement or under said proposed contracts; and whenever they may deem expedient, they may abandon the objects contemplated in this agreement and said proposed contracts and all further proceedings thereunder. In such event all the stocks and other assets by them acquired hereunder and then held for account of the Syndicate, and the proceeds of such stocks and other assets shall remain charged with the payment of all expenses and liabilities by them incurred hereunder and shall be applied:

First, to the payment of any and all expenses and obligations incurred by J. P. Morgan & Co. under any provision of this agreement;

Secondly, in repayment to the Subscribers (so far as the same may be sufficient for that purpose) of all sums by them respectively paid to J. P. Morgan & Co. pursuant to Article Second; such repayment to be made to the Subscribers ratably.

From time to time J. P. Morgan & Co. may sell or otherwise dispose of such stocks and other assets at such prices and on such terms as to credit or otherwise as they may deem expedient; or they may distribute the same to Subscribers ratably.

Fourteenth. The enumeration of specific powers in this agreement shall not be construed as in any way limiting any general power intended to be conferred upon or to be reserved to J. P. Morgan & Co.; it being intended to reserve to them, and hereby there are expressly conferred on them, in addition to the general and specific powers recited herein, all other general and specific powers which from time to time they may deem necessary in order fully and effectively to carry out what they may deem to be the purposes of this agreement, and of this Syndicate, whether or not such purposes be herein expressed.

J. P. Morgan & Co. in their discretion may submit to the Subscribers any proposed change or modification of this agreement, and, when assented to in writing by a majority in interest of the Subscribers, any change or modification so submitted by J. P. Morgan & Co. shall become a part of this agreement and shall be binding upon all the Subscribers and those claiming under them.

Fifteenth. J. P. Morgan & Co. shall not be liable for any error of judgment or for any mistake of law or of fact; nor shall they be liable for any act or omission while endeavoring in good faith to carry out the purposes hereof according to their judgment. No obligation or liability, in addition to those herein expressed, shall be implied against J. P. Morgan & Co.

In no event shall J. P. Morgan & Co. be responsible for the repayment to the Subscribers of the sums by them paid under Article Second hereof; but such sums shall be repayable only as herein provided, out of any stocks or other assets applicable to such payment under the provisions of this agreement.

Sixteenth. J. P. Morgan & Co. may become Subscribers hereto. As such Subscribers they shall be liable for any subscriptions made by them, and shall be entitled in all respects to the same rights and benefits as other Subscribers.

J. P. Morgan & Co. may sell any stocks or other assets by them held hereunder to any other Subscriber; and any such other Subscriber may make any purchase from J. P. Morgan & Co.

From time to time J. P. Morgan & Co. may offer, on such terms as they may deem expedient, to sell any such stocks or other assets to the Subscribers severally and ratably in amounts proportionate to their respective syndicate subscriptions; and in any such offering they may provide for the disposition of any untaken stocks or other assets in such way as they may deem expedient. Upon any offering J. P. Morgan & Co., as syndicate Subscribers, shall be entitled, the same as other Subscribers to the benefits of such offering and to purchase their ratable amount of the stocks or other assets so offered and to hold the same without further accountability.

Seventeenth. J. P. Morgan & Co. may receive and may hold, or may cause to be received and to be held by any depositaries or custodians, the certificates for any stocks or any bonds of the Steel Company, and any bonds of the Carnegie Company and the certificates for any stocks of all or of any of the other companies hereinabove referred to, and they shall not be responsible for any act or any omission of any such depositary or custodian. They shall have absolute control over the disposition of all such stocks and bonds held by them, or by any such depositary or custodian, and they may cause the same to be transferred to themselves, or, as they may deem expedient, to any person or persons, or corporation or corporations. While so held by them, or under their control, J. P. Morgan & Co. shall have the exclusive right, and hereby plenary and discretionary power is conferred upon them, to vote upon such stocks, or to cause the same to be voted by their nominees, or by any proxies appointed or selected by them, at all meetings of stockholders for the election of directors of any such company, and for any and all other purposes whatsoever.

Eighteenth. This agreement shall bind, and is for the benefit of, the parties hereto, and their respective executors and administrators; but no assignment hereunder shall be valid unless assented to in writing by J. P. Morgan & Co.

All rights and powers of J. P. Morgan & Co. hereunder shall vest in said firm as from time to time constituted, without further act or assignment.

Nineteenth. Nothing herein contained shall be construed as creating any trust or obligation whatsoever in favor of the Steel Company, or in favor of any stockholder of any of such other companies, or in favor of any person or corporation other than the Subscribers, nor any obligation in favor of the Subscribers, excepting only as herein is expressly provided.

Twentieth. Each Subscriber shall set opposite his subscription hereunder an address to which notices, calls or other communications may be sent, and any notice, call or other communication addressed to any Subscriber at the address so given, and either left at such address or mailed, shall be deemed actually given to such Subscriber, and shall be sufficient for all the purposes hereof. If any Subscriber shall fail so to furnish his address to J. P. Morgan & Co., he shall not be entitled to any notice of calls, or offers, or any other notice hereunder, and he shall be deemed to assent to any action of J. P. Morgan & Co.

In witness whereof, the parties of the first part have hereunto affixed their signatures, and the parties of the second part at various dates have affixed their subscriptions hereto, it being understood that for convenience this agreement may be subscribed in several parts and copies, with like force and effect as if all the subscriptions were upon one part or copy thereof.

Name.	Address.	Amount subscription in dollars.

Exhibit 4.

CIRCULAR LETTER OF MARCH 2, 1901, ADDRESSED BY J. P. MORGAN & CO. TO STOCKHOLDERS OF VARIOUS CONSTITUENT CONCERNS OF THE UNITED STATES STEEL CORPORATION.

March 2, 1901.

To the Stockholders of Federal Steel Company, National Steel Company, National Tube Company, American Steel and Wire Company of New Jersey, American Tin Plate Company, American Steel Hoop Company, American Sheet Steel Company.

The United States Steel Corporation has been organized under the laws of the State of New Jersey, with power, among other things, to acquire the outstanding preferred stocks and common stocks of the companies above named and the outstanding bonds and stock of the Carnegie Company.

A Syndicate, comprising leading financial interests throughout the United States and Europe, of which the undersigned are managers, has been formed by subscribers to the amount of $200,000,000 (including among such subscribers the undersigned and many large stockholders of the several companies), to carry out the arrangement hereinafter stated and to provide the sum in cash and the financial support required for that purpose. Such Syndicate, through the undersigned, has made a contract with the United States Steel Corporation, under which the latter is to issue and deliver its preferred stock and its common stock and its five per cent gold bonds in consideration for stocks of the above-named companies and bonds and stock of the Carnegie Company and the sum of $25,000,000 in cash.

The Syndicate has already arranged for the acquisition of substantially all the bonds and stock of the Carnegie Company, including Mr. Carnegie's holdings. The bonds of the United States Steel Corporation are to be used only to acquire bonds and 60 per cent of the stock of the Carnegie Company.

The undersigned, in behalf of the Syndicate, and on the terms and conditions hereinafter stated, offer in exchange for the preferred stocks and common stocks of the companies above named, respectively, certificates for preferred stock and common stock of the United States Steel Corporation, upon the basis stated in the following table, viz:

For each $100 par value of stock of the class mentioned below, the amount set opposite thereto in preferred stock or common stock of United States Steel Corporation at par:

Name of company and class of stock.	Amount of new stock to be delivered in par value.	
	Preferred stock.	Common stock.
Federal Steel Co.:		
Preferred stock	$110.00	....
Common stock	4.00	$107.50
American Steel and Wire Co. of N. J.:		
Preferred stock	117.50	....
Common stock	....	102.50
National Tube Co.:		
Preferred stock	125.00	....
Common stock	8.80	125.00
National Steel Co.:		
Preferred stock	125.00	....
Common stock	....	125.00
American Tin Plate Co.:		
Preferred stock	$125.00	....
Common stock	20.00	$125.00
American Steel Hoop Co.:		
Preferred stock	100.00	....
Common stock	....	100.00
American Sheet Steel Co.:		
Preferred stock	100.00	....
Common stock	....	100.00

With reference to the last four companies the aggregate amount of stocks so to be offered was arranged with the principal stockholders of those companies, who have requested the distribution of such amount among the four companies to be made in the percentages above stated.

Proper adjustment will be made in respect of dividends upon all the deposited preferred stocks, so that the registered holders of receipts for such preferred stocks will receive the equivalent of dividends thereon, at the rates therein provided, from the last dividend period up to April 1, 1901, from which date dividends on the preferred stock of the United States Steel Corporation are to begin to accrue. Deposited common stocks must carry all dividends or rights to dividends declared or payable on or after March 1, 1901, and no adjustment or allowance will be made in respect thereof.

For the purpose of avoiding the necessity of interruption in the declaration and payment of dividends, when earned, upon the common stock, concurrently with the payment of dividends upon the preferred stock, there has been inserted in the charter of the United

States Steel Corporation a provision to the effect that whenever all quarterly dividends accrued upon the preferred stock for previous quarters shall have been paid, the board of directors may declare dividends on the common stock out of any remaining surplus or net profits.

Statements furnished to us by officers of the several companies above named, and of the Carnegie Company, show that the aggregate of the net earnings of all the companies for the calendar year 1900 was amply sufficient to pay dividends on both classes of the new stocks, besides making provision for sinking funds and maintenance of properties. It is expected that by the consummation of the proposed arrangement the necessity of large deductions heretofore made on account of expenditures for improvements will be avoided, the amount of earnings applicable to dividends will be substantially increased and greater stability of investment will be assured, without necessarily increasing the prices of manufactured products.

The certificates for stocks of the companies above named must be deposited as stated below, in exchange for TRANSFERABLE RECEIPTS issued by the respective depositaries, for which application will be made for listing on the New York Stock Exchange. The deposited certificates must be accompanied by suitable assignments and powers of attorney in blank, duly executed and having attached thereto the proper war revenue stamps, and also, if required, suitable assignments or transfers of all dividends or rights to dividends upon deposited common stocks declared or payable on or after March 1, 1901. Every deposit shall be upon the following further terms and conditions:

1. The undersigned, acting in behalf of the Syndicate, shall have full control over the deposited certificates, including power to deliver the same under said contract to the United States Steel Corporation in consideration of the issue of preferred stock and common stock of said Corporation.

2. The certificates for shares of the United States Steel Corporation, deliverable to depositors, shall be delivered at an office or at offices in the city of New York to be designated by the undersigned by advertisement in at least two newspapers in the city of New York. Such certificates may be issued in the names of the respective holders of the receipts entitled thereto or may be issued in such other names as the undersigned may select, in which event they shall be indorsed for transfer in blank at the time of delivery. The undersigned at their option may deliver temporary certificates for such shares pending the preparation and delivery of engraved certificates.

3. At any time prior to the deposit hereunder of two-thirds in amount of all outstanding shares of the capital stock of any one or more of the above-named companies (which two-thirds in each instance shall include two-thirds of the outstanding preferred stock of such company), the undersigned in their discretion may withdraw the offer herein made to depositors of shares of any such company of whose capital stock two-thirds shall not have been deposited; and, in such case, no act or notice of withdrawal shall be required other than advertisement thereof at least once in each of two daily newspapers in the city of New York. Upon any such withdrawal.

the deposited shares of such company shall be returned without charge, upon surrender of the respective receipts issued therefor. The undersigned, in their discretion, may consummate the proposed transaction as to the stocks of any companies herein named, irrespective of the deposit of the stocks of any other company or of any withdrawal as to any other company.

4. The undersigned are authorized to proceed with the proposed transaction whenever in their sole judgment a sufficient amount of the stocks of said companies, or of any of them, shall have been deposited. They reserve the right, at any time, in their discretion, to wholly abandon the transaction and to withdraw their offer herein contained, as to all the depositors, by publication of notice of such withdrawal in two daily newspapers in the city of New York; and in that event all the deposited shares shall be returned without charge upon surrender of the respective receipts therefor. In case of any such withdrawal of the offer hereunder as to all or to any depositors, such depositors shall have no claim against the undersigned, and shall only be entitled to receive their deposited securities upon surrender of the respective receipts therefor.

5. The authorized issue of capital stock of the United States Steel Corporation presently provided for in said contract is $850,000,000, of which one-half is to be seven per cent cumulative preferred stock and one-half is to be common stock. The company will also issue its five per cent gold bonds to an aggregate amount not exceeding $304,000,000. In case less than all of the bonds and stock of the Carnegie Company or less than all of the stocks of the other companies above referred to shall be acquired, the amounts of bonds and stocks to be issued will be reduced as provided in said contract.

The forms of the new bonds and of the indenture securing the same, and of the certificates for the new preferred and common shares, and the entire plan of organization and management of the United States Steel Corporation, shall be determined by J. P. Morgan & Co. Every depositor shall accept in full payment and exchange for his deposited stock the shares of the capital stock of the United States Steel Corporation, to be delivered at the rates above specified, in respect of the stock by him so deposited; and no depositor or holder of any receipt issued hereunder shall have any interest in the disposition of any other of the shares of stock, or of the bonds of the United States Steel Corporation, by it to be issued and delivered to or for account of the Syndicate or of any proceeds thereof. All shares of the United States Steel Corporation deliverable to or for account of the Syndicate, which shall not be required for the acquisition of the stock of the Carnegie Company or for delivery to depositors under the terms of this circular, are to be retained by and belong to the Syndicate.

6. The respective depositaries may make all such rules as shall be approved by the undersigned, governing the transfer and registration of receipts for deposited shares, and for the closing of the transfer books for such receipts for any purpose. The undersigned shall not be responsible for any default of any depositary.

7. Each deposit hereunder shall be irrevocable, and shall operate as a separate and independent agreement, and as a transfer of the interest of the depositors to the undersigned on the terms hereof.

8. Deposits must be made with the following depositaries respectively:

Federal Steel preferred stock " " common stock	with	Colonial Trust Co., N. Y., or with Old Colony Trust Co., Boston.
National Tube preferred stock " " common stock	"	Morton Trust Co., N. Y., or with Kidder, Peabody & Co., Boston.
American Steel & Wire preferred stock	"	Standard Trust Co., N. Y.
" " " common stock	"	Guaranty Trust Co., N. Y.
National Steel preferred stock " " common stock	"	Central Trust Co., N. Y.
American Tin Plate preferred stock " " " common stock	"	Mercantile Trust Co., N. Y.
American Sheet Steel preferred stock " " " common stock	"	Farmers' Loan & Trust Co., N. Y.
American Steel Hoop preferred stock " " " common stock	"	N. Y. Security & Trust Co., N. Y.

Deposits must be made on or before the 20th day of March, 1901. After that date no deposit will be received except in the discretion of the undersigned, and on such terms as the undersigned may prescribe.

The undersigned reserve the right in their discretion to TERMINATE THE PRIVILEGE OF DEPOSIT hereunder at an earlier date upon two days' notice to be given by publication at least once in two daily newspapers in New York City.

It is proper to state that J. P. Morgan & Co. are to receive no compensation for their services as syndicate managers beyond a share in any sum which ultimately may be realized by the Syndicate.

J. P. MORGAN & CO.,
Syndicate Managers.

EXHIBIT 5.

SYNDICATE AGREEMENT OF MARCH 12, 1902, BETWEEN J. P. MORGAN & CO. AND SYNDICATE SUBSCRIBERS, RELATIVE TO CONVERSION OF A PORTION OF THE PREFERRED STOCK OF THE UNITED STATES STEEL CORPORATION INTO BONDS.

An agreement, made the twelfth day of March, 1902, by and between J. P. Morgan & Co., co-partners as bankers, of the city of New York, parties of the first part; and the subscribers hereto (hereinafter called severally the "Subscribers," and collectively the "Syndicate"), severally parties of the second part:

Whereas, the United States Steel Corporation (hereinafter called the "Steel Company") proposes to make with J. P. Morgan & Co. a certain contract or contracts whereunder in behalf and account of the Steel Company, they are to offer to all of the preferred stockholders of the Steel Company, severally and ratably, the preferential opportunity of subscribing for, and of taking at par the "ten-sixty year" five per cent sinking fund gold bonds of the Steel Company, in even amounts approximately equal to forty per cent of their several holdings of preferred stock, such subscriptions to be payable in such preferred stock at par, provided that every such subscribing stockholder at the time of such original subscription payable in preferred stock shall have the right at his option then to make an additional subscription payable in cash for such bonds to an amount equal to twenty-five per cent of his stock subscription; such bonds to be authorized now for the principal sum of $250,000,000; and,

Whereas, in and by such contracts J. P. Morgan & Co. are to guaranty to the Steel Company that subscriptions for such bonds will be made for the aggregate sum of at least $100,000,000, payable in preferred stock to the extent of four-fifths of said sum, and in cash for the remaining one-fifth thereof; such contracts to provide for the payment or allowance to J. P. Morgan & Co. of a commission of four per cent upon the aggregate par amount of all such bonds, which shall be sold and delivered under their said offer, or to them, they having the prior right to take all of such bonds which shall be offered for subscription, and which shall not be taken by the preferred stockholders under such offer; and,

Whereas, upon the terms of this agreement, and for the purposes above mentioned, all of the parties hereto now desire to form a syndicate, to provide and to furnish to J. P. Morgan & Co., for delivery to the Steel Company the preferred stock, and the cash required under their said guaranty; and to receive from J. P. Morgan & Co. four-fifths of the net commissions by them received under the said contract or contracts with the Steel Company, which contracts J. P. Morgan & Co. are authorized from time to time to make, modify and perform, as in the exercise of their unlimited discretion from time to time they shall deem expedient; now,

Therefore, in consideration of the premises, and of the mutual promises herein contained, J. P. Morgan & Co. and the syndicate mutually have agreed, and do agree, as follows, viz:

First. On signing this agreement, each subscriber has delivered to J. P. Morgan & Co. certificates for preferred stock of the Steel Company in the amount indicated in his stock subscription hereto, which preferred stock, to such extent as may be required to meet the requirements of their said guaranty, is to be delivered to the Steel Company at par in exchange for the ten-sixty year five per cent gold bonds of the Steel Company for an equal amount at par, to be received therefor by such subscriber, and any such preferred stock not so delivered to the Steel Company is to be returned to the subscribers ratably according to their several subscriptions.

Second. Each subscriber further agrees to pay to J. P. Morgan & Co., in cash the sum specified in his cash subscription hereto, for which cash J. P. Morgan & Co. shall receive from the Steel Company bonds as aforesaid at par equal to the amount of such cash payment by such subscriber.

Third. The several deliveries and undertakings of the several subscribers under this agreement shall be made and performed by the subscribers, respectively, when and as requested by J. P. Morgan & Co., and without reference to the receipt or the possession by J. P. Morgan & Co., or by the subscribers, of any of said five per cent sinking fund gold bonds of the Steel Company.

Fourth. The several subscribers shall be called upon to make payments of cash in respect of their several subscriptions only ratably according to the several amounts thereof; but each subscriber shall be so responsible to the full extent of his several undertaking regardless of performance or non-performance by any other subscriber. In the same proportion, except as otherwise above provided, each subscriber shall be entitled to share in the benefits, and shall bear any loss, resulting to the syndicate under this agreement. Nothing herein contained shall constitute the parties hereto partners, or shall render any one of the subscribers liable to contribute more than his several proportionate amount as herein provided.

Fifth. In case of the failure of any subscriber to perform any of his undertakings hereunder as and when called for by them, J. P. Morgan & Co., in behalf of themselves and the syndicate, shall have, and at their sole and exclusive option they may exercise, the right to exclude such subscriber from all interest in the syndicate; and in their discretion, without any proceedings either at law or in equity, they may dispose of such subscriber's participation hereunder or of any interest or right of such subscriber hereunder or under any of said proposed contracts; but nevertheless such subscriber in default shall be responsible to J. P. Morgan & Co., for the benefit of themselves and the other subscribers hereto, for all damages caused by any failure on his part. At any public sale under this article of any interest or right of any subscriber, J. P. Morgan & Co., or any party thereto, may become purchaser for their, or for his own, benefit, without accountability; but notwithstanding any sale, whether public or private, the defaulting subscriber shall be responsible to J. P. Morgan & Co. and to the syndicate for all damage caused by any such failure on his part.

Sixth. J. P. Morgan & Co. shall have full power, in their discretion, from time to time, to agree with the Steel Company upon the terms and provisions of any contracts such as are above referred to; and, also, from time to time, to enter into any agreements with the Steel Company modifying the said contracts as they may deem expedient. They may deliver to the Steel Company a copy of this agreement, having annexed thereto a list of the subscribers; and thereupon to the extent of their several subscriptions, the subscribers, severally and respectively, but not jointly, and no one for any other, shall become responsible for the performance of such contracts with the Steel Company in discharge of the obligation thereunder of J. P. Morgan & Co. Any and all contracts with the Steel Company made by J. P. Morgan & Co. shall be open to inspection by any subscriber at the office of J. P. Morgan & Co.

Seventh. J. P. Morgan & Co. shall be the sole and final judges as to whether at any time it is to the interest of the syndicate to proceed further under this agreement or under said proposed contracts; and, whenever they may deem expedient, they may abandon the objects contemplated in this agreement and said proposed contracts and all further proceedings thereunder. In such event all the cash or stock and bonds by them received and then held for account of the syndicate, and the proceeds of such stock and bonds shall remain charged with the payment of all expenses and liabilities by them incurred hereunder and shall be applied:

First, to the payment of any and all expenses and obligations incurred by J. P. Morgan & Co. under any provision of this agreement;

Secondly, in repayment to the subscribers (so far as the same may be sufficient for that purpose) of all amounts of preferred stock or of cash by them respectively delivered hereunder to J. P. Morgan & Co.; such repayment to be made to the subscribers ratably.

Eighth. J. P. Morgan & Co. shall be sole managers of the syndicate, and in behalf of the syndicate they may make any and all arrangements, and may perform any and all acts, even though not herein provided for, in their opinion necessary or expedient to carry out the purposes of this agreement, or to promote or to protect what they deem to be the best interests of the syndicate.

The enumeration of specific powers in this or in any other article of this agreement shall not be construed as in any way abridging the general powers by this article intended to be conferred upon or reserved to J. P. Morgan & Co.

Ninth. From time to time before October 1, 1903, J. P. Morgan & Co., in behalf of the syndicate, may make sales of all or any part of the bonds received by them for account of the syndicate. Any such sales may be made by J. P. Morgan & Co. either publicly or privately, by themselves, or in such manner as they may deem proper, and shall be upon such terms and for such price or prices as they may deem expedient. Each subscriber hereby assents, to, and agrees to be bound by, any such action.

No subscriber shall be entitled to receive any of said bonds before October 1, 1903. In the meantime, in their discretion, J. P. Morgan & Co., either themselves may retain all or any of such bonds, or they may deliver to any subscriber his proportionate part thereof, upon his agreement to hold the same subject to sale by J. P. Morgan & Co. and to return the same upon call of J. P. Morgan & Co., at any time before October 1, 1903.

Should any subscriber desire to withdraw from sale the portion of bonds to which he may be entitled hereunder, J. P. Morgan & Co. in their discretion may deliver to any subscriber his portion of such bonds, upon his agreement to hold the same for himself without sale until October 1, 1903, or until the complete sale by J. P. Morgan & Co. at an earlier date of all bonds held by or for the syndicate.

Tenth. Until October 1, 1903, or until the final distribution hereunder, J. P. Morgan & Co., in such manner, at such prices, on such terms, and in such amounts, as they may deem expedient, shall have power, for account of the syndicate, to make purchases of the five per cent gold bonds and of the preferred stock of the Steel Company, and they may resell any such bonds and stocks which they may have purchased; and, in their discretion, they may make any further undertakings of any kind with any persons concerning any such bonds and stocks. They may apply towards any such purchases any sums realized from any sales of bonds and stocks of the Steel Company under any provision of this agreement; and they may make advances, or may procure loans, and may secure the same to such amounts and in such manner as from time to time they may deem expedient for any of the purposes of this agreement.

Eleventh. J. P. Morgan & Co. shall issue to the subscribers suitable receipts in respect of payments made hereunder, and they may issue to the respective subscribers certificates of interest of such tenor and form as they may deem suitable. Such certificates of interest and all rights and obligations hereunder of the respective subscribers may be made transferable in such manner and on such terms and conditions as J. P. Morgan & Co. may prescribe.

Twelfth. J. P. Morgan & Co. shall have authority, from time to time and at any time, to incur such expenses as they may deem proper in carrying out, or in endeavoring to carry out, this agreement or said proposed contracts, or in doing any act or thing which they may deem to be in the interest of the syndicate, and all such expenses shall constitute and be a prior charge in their favor upon any and all moneys, stocks and bonds by them received or held hereunder. Any and all moneys by them received hereunder shall be held by them as bankers in general account. They also shall have power and authority, in their sole and absolute discretion, finally to fix and to pay all compensations of depositaries, brokers, agents and counsel, or others, and in the expense account may be included brokers' commission as usually paid.

Thirteenth. After the complete performance of the entire obligation of the syndicate hereunder, but not before the first day of October, 1903, unless otherwise determined by J. P. Morgan & Co. in the exercise of their unrestricted discretion, the syndicate shall be entitled to receive four-fifths portion of the net commissions received by J. P. Morgan & Co., or such part thereof as may not have been used by J. P. Morgan & Co. for the purposes of this agreement, out of any moneys for such purpose received or retained by J. P. Morgan & Co., after payment of all expenses and obligations incurred hereunder by J. P. Morgan & Co.

Fourteenth. J. P. Morgan & Co. shall not be liable under any of the provisions of this agreement nor for any matter therewith connected, except for good faith in performing, or in refraining from performing or carrying out, the obligations by them herein expressly assumed; the implication of any obligation not herein expressly assumed by them being hereby expressly denied and waived.

It is understood that, in the same manner as other subscribers, J. P. Morgan & Co. may become subscribers hereto; that as such subscribers they shall be liable for all subscriptions by them made, and that in all respects they shall be entitled to the same rights and benefits as any other subscriber. Any subscriber hereto may, on his own account, make any agreement with any other subscriber or with the Steel Company.

Fifteenth. This agreement shall bind, and is for the benefit of, the parties hereto, and their executors and administrators severally and respectively; but no assignment hereunder shall be valid unless assented to in writing by J. P. Morgan & Co.

All rights and powers of J. P. Morgan & Co. hereunder shall vest in said copartnership firm, as from time to time constituted, without further act or assignment.

Sixteenth. Nothing herein contained shall be construed as creating any trust or obligation whatsoever in favor of any person or corporation other than the subscribers, nor any obligation in favor of the subscribers, excepting only as herein is expressly provided.

Seventeenth. Each subscriber shall set opposite his subscription hereunder an address, to which notices, calls or other communications may be sent, and any notice, call or other communication addressed to any subscriber at the address so given, and either left at such address or mailed, shall be deemed actually given to such subscriber, and shall be sufficient for all the purposes hereof. If any subscriber shall fail so to furnish his address to J. P. Morgan & Co., he shall not be entitled to any notice of calls, or offers, or any other notice hereunder, and he shall be deemed to assent to any action of J. P. Morgan & Co.

Eighteenth. In consideration of the irrevocable rights in them vested hereunder, and the promises of the several subscribers, J. P.

Morgan & Co. have become parties to, and in good faith will endeavor to consummate the purposes of this agreement; and, after receipt thereof from the Steel Company, they will, as herein provided, deliver to the syndicate the said five per cent gold bonds or the proceeds thereof, and the said cash compensation.

In witness whereof, the parties of the first part have hereunto affixed their signatures, and the parties of the second part at various dates have affixed their subscriptions hereto, it being understood that for convenience this agreement may be subscribed in several parts and copies with like force and effect as if all the subscriptions were upon one part or copy thereof.

Name.	Address.	Subscription for 5 per cent gold bonds.	
		Preferred stock.	Cash.

Exhibit 6.

PRO FORMA CONSOLIDATED GENERAL BALANCE SHEET, UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES, APRIL 1, 1901, IN COMPARISON WITH SIMILAR BALANCE SHEET AT DECEMBER 31, 1910.

ASSETS.

	Apr. 1, 1901.	Dec. 31, 1910.	Increases.[1]
Property account:			
Cost of property of all companies at dates acquired by United States Steel Corporation Apr. 1, 1901, in case of 11 subsidiary companies, and Aug. 1, 1901, in case of Shelby Steel Tube Co	$1,297,400,000.02	$1,297,400,000.02	
Sundry adjustments applying against preceding year's balances of property account		3,063,594.00	$3,063,594.00
Expended for additional property and construction since Apr. 1, 1901		339,348,676.71	339,348,676.71
Additions to property investment account, through purchase of—			
Union Steel properties		30,280,632.07	30,280,632.07
Clairton Steel properties		10,759,560.42	10,759,560.42
Tennessee Coal, Iron and Railroad properties		48,961,208.83	48,961,208.83
	1,297,400,000.02	1,729,813,672.05	432,413,672.03
Less, charged off as follows—			
To sinking and depreciation funds		39,706,567.88	39,706,567.88
To extraordinary replacement funds		1,632,011.99	1,632,011.99
To undivided surplus		163,694,423.16	163,694,423.16
		205,033,003.03	205,033,003.03
Balance of property account, subject to offsetting balance to credit of depreciation and replacement funds, see contra.	1,297,400,000.02	1,524,780,669.02	227,380,669.00
Balance of investment in mine stripping and development, etc	1,417,984.33	23,103,712.21	21,685,727.88
Total property investment account, subject to depreciation reserves as above stated	1,298,817,984.35	1,547,884,381.23	249,066,396.88

PRO FORMA CONSOLIDATED GENERAL BALANCE SHEET, UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES, APRIL 1, 1901, IN COMPARISON WITH SIMILAR BALANCE SHEET AT DECEMBER 31, 1910—Continued.

ASSETS—Continued.

	Apr. 1, 1901.	Dec. 31, 1910.	Increase.[1]
Deferred charges to operations:			
Advanced mining royalties, exploration expenses and miscellaneous charges	$2,088,027.09	$15,331,704.91	$13,243,677.82
Less fund reserved from surplus to cover possible failure to realize mining royalties		7,000,000.00	7,000,000.00
	2,088,027.09	8,331,704.91	6,243,677.82
Investments:			
Outside real estate and investments in sundry securities, including real estate mortgages, and land sales contracts	241,030.19	2,369,394.04	2,128,363.85
Sinking and reserve fund assets:			
Cash resources held by trustees of bond sinking funds	238.99	856,519.00	856,280.01
Contingent fund and miscellaneous assets		3,295,464.79	3,295,464.79
Insurance and depreciation funds' assets (net)		11,915,921.45	11,915,921.45
	238.99.	16,067,905.24	16,067,666.25
Current assets:			
Inventories	71,852,438.59	176,537,823.71	104,685,385.12
Accounts receivable	50,910,860.78	44,603,273.53	*5,610,753.49*
Agents' balances		696,833.76	
Bills receivable	3,280,190.41	5,540,180.77	2,259,990.36
Sundry marketable bonds and stocks	10,168,823.84	4,410,793.61	*5,758,030.23*
Cash	56,153,066.01	56,953,514.16	800,448.15
	192,365,379.63	288,742,419.54	96,377,039.91
Grand total	1,493,512,660.25	1,863,395,804.96	369,883,144.71

LIABILITIES.

	Apr. 1, 1901.	Dec. 31, 1910.	Increase.[1]
Capital stock of United States Steel Corporation:			
Common	$508,227,393.70	$508,302,500.00	$75,106.30
Preferred	510,205,743.40	360,281,100.00	*149,924,643.40*
	1,018,433,137.10	868,583,600.00	*149,849,537.10*
Capital stock of subsidiary companies not owned by United States Steel Corporation	535,407.00	620,352.50	84,945.50
Bonded and debenture debt (not including bonds held by sinking-fund trustees):			
United States Steel Corporation 50-year bonds	303,450,000.00	274,412,000.00	*29,038,000.00*
United States Steel Corporation 10–60-year bonds		190,777,500.00	190,777,500.00
Subsidiary companies' bonds	59,091,657.42	131,162,366.70	72,070,709.28
	362,541,657.42	596,351,866.70	233,810,209.28
Mortgages and purchase-money obligations:			
Mortgages (sundry real estate)	4,109,400.41	784,792.38	*3,324,608.03*
Purchase-money obligations	17,762,622.19	2,313,000.00	*15,449,622.19*
	21,872,022.60	3,097,792.38	*18,774,230.22*
Current liabilities:			
Current accounts payable and pay rolls	27,466,679.68	23,695,264.04	3,018,411.52
Accrued taxes, not yet due		6,789,827.16	
Bills and loans payable	17,134,803.02	813,500.00	*16,321,303.02*
Special deposits on loans due employees and others	7,622,490.23	886,122.16	*6,736,368.07*
Accrued interest and unpresented coupons	3,064,929.23	7,991,373.15	4,926,443.92
Unpaid accrued dividends of subsidiary companies	2,852,388.30		*2,852,388.30*
United States Steel Corporation dividends declared, not yet due		12,658,700.50	12,658,700.50
	58,141,290.46	52,834,787.01	*5,306,503.45*
Total capital and current liabilities	1,461,523,514.58	1,521,488,398.59	59,964,884.01

PRO FORMA CONSOLIDATED GENERAL BALANCE SHEET, UNITED STATES STEEL CORPORATION AND SUBSIDIARY COMPANIES, APRIL 1, 1901, IN COMPARISON WITH SIMILAR BALANCE SHEET AT DECEMBER 31, 1910—Continued.

LIABILITIES—Continued.

	Apr. 1, 1901.	Dec. 31, 1910.	Increase.[1]
Sundry reserve funds:			
Contingent and miscellaneous operating funds	$2,428,084.62	$11,689,728.70	$9,261,644.08
Insurance funds	450,882.42	8,402,999.21	7,952,116.79
	2,878,967.04	20,092,727.91	17,213,760.87
Bond sinking, depreciation and replacement funds (represents a balance of reserves made from earnings and income to cover accruing amortization and depreciation in respect of assets covered in property-investment account)	4,110,178.63	[2] 117,671,520.47	113,561,341.84
Appropriated surplus to cover capital expenditures		40,000,000.00	40,000,000.00
Undivided surplus of United States Steel Corporation and subsidiary companies:			
Capital surplus provided in organization	25,000,000.00	25,000,000.00	
Balance of surplus accumulated by all companies since Apr. 1, 1901, viz—			
Total exclusive of I. C. P. in inventories		105,438,718.67	105,438,718.67
Inter-company profit in inventories		33,704,439.32	33,704,439.32
	25,000,000.00	164,143,157.99	139,143,157.99
Grand total	1,493,512,660.25	1,863,395,804.96	369,883,144.71

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[1] Decreases in italics.

[2] In the balance sheet of December 31, 1910, as published in the annual report of the Corporation, this amount has been written off the property account, which reduces the totals of the asset and liability sides of the balance sheet a corresponding amount.

EXHIBIT 7.

ISSUED CAPITAL STOCK OF THE CONSTITUENT COMPANIES OF THE UNITED STATES STEEL CORPORATION, AMOUNT OWNED BY THE SAID CORPORATION, THE ISSUED CAPITAL STOCK OF THE SUBSIDIARIES OF SAID CONSTITUENT COMPANIES AND PERCENTAGE THEREOF OWNED BY THE LATTER, JULY 1, 1911.

NOTE.—The following schedule does not show all the properties of the Steel Corporation, but instead shows, first, the *constituent* companies whose stocks are directly owned by the Steel Corporation; and, second, the subsidiary companies of these constituent concerns with, in some instances, the subsidiaries of such subsidiaries.

Most of the constituent companies own property in fee as well as own stocks in other companies. Thus, the Carnegie Steel Company of New Jersey owns in fee all the property previously owned by the National Steel Company and the American Steel Hoop Company, while, as indicated below, a large part of the property of some of the other concerns is held in fee. The Federal Steel Company, however, is exclusively a holding concern.

The indebtedness of the various companies is not shown in this table. A large amount of such indebtedness is owned within the organization, and therefore is of no special interest.

UNITED STATES STEEL CORPORATION (NEW JERSEY).

Capital stock outstanding: Common, $508,302,500; preferred, $360,281,100.

The "constituent" companies whose capital stocks are directly owned by the United States Steel Corporation, together with the capital stocks of those companies, on the above date were as follows:[1]

	Total capital stock issued and outstanding.	Amount not owned by U. S. Steel Corp'n.	Amount owned by U. S. Steel Corp'n.
Carnegie Steel Co	$65,250,000.00		$65,250,000.00
Federal Steel Co.:			
Common	46,484,300.00		46,484,300.00
Preferred	53,260,900.00		53,260,900.00
American Steel & Wire Co.:			
Common	50,000,000.00	$10,600.00	49,989,400.00
Preferred	40,000,000.00	1,000.00	39,999,000.00
National Tube Co.:			
Common	40,000,000.00		40,000,000.00
Preferred	40,000,000.00		40,000,000.00
American Sheet & Tin Plate Co.:			
Common	24,500,000.00	400.00	24,499,600.00
Preferred	24,500,000.00	400.00	24,499,600.00
American Bridge Co	10,000,000.00		10,000,000.00
Shelby Steel Tube Co.:			
Common	8,151,500.00		8,151,500.00
Preferred	5,000,000.00		5,000,000.00
Lake Superior Consolidated Iron Mines	29,887,448.97		29,887,448.97
Union Steel Co	20,000,000.00		20,000,000.00
Clairton Steel Co	3,500,000.00		3,500,000.00
Tennessee Coal, Iron & R. R. Co.:			
Common	32,529,997.50	87,202.50	32,442,795.00
Preferred	124,500.00	124,500.00	
Guaranteed preferred	178,600.00	178,600.00	

CARNEGIE STEEL COMPANY (NEW JERSEY).

Capital stock, $65,250,000. All owned by United States Steel Corporation.

In addition to the amount of capital stock as above, the Carnegie Steel Company has a capital surplus account of $189,000,000 arising as follows: In 1903 a consolidation or merger was made of the Carnegie Company, National Steel Company, and American Steel Hoop Company. The aggregate amount of capital stocks of these three companies before the merger was $252,000,000. The stock of the merged or consolidated company was fixed at 25 per cent of the total of the old companies' stocks, or $63,000,000 (since increased to $65,250,000), thus giving to the consolidated company a capital surplus of $189,000,000.

The Carnegie Steel Company of New Jersey, aside from owning in fee all the manufacturing properties formerly owned by the National Steel Company and the American Steel Hoop Company, also controls the following companies through ownership of their capital stocks, the total capital stock of said companies being as stated below:

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[1] See note 1, page 414.

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
3. Carnegie Steel Co. (Pa.)	$50,000,000	100
3. Carnegie Natural Gas Co	300,000	100
3. Union R. R. Co	2,000,000	100
3. Slackwater Connecting R. R. Co	10,000	100
3. Etna & Montrose R. R. Co	60,000	100
4. Sharon Connecting R. R. Co	10,000	100
3. Pittsburg & Conneaut Dock Co	100,000	100
3. Youghiogheny Northern R. R. Co	400,000	100
3. Mt. Pleasant Water Co	150,000	100
3. Trotter Water Co	850,000	100
3. Union Supply Co	500,000	100
3. Bessemer & Lake Erie R. R. Co	500,000	100
2. Pittsburg, Bessemer & Lake Erie R. R. Co.:		
Common	10,000,000	55
Preferred	2,000,000	38
3. Carnegie Land Co	10,000	100
3. Conneaut Land Co	10,000	100
3. Conneaut & Eastern R. R. Co	1,000	100
2, 5. Pennsylvania & Lake Erie Dock Co	675,000	52
2. Columbus Stone Co	60,000	100
2. Mahoning Limestone Co	50,000	51
3. Isabella Limestone Co	3,000	67
3. Pittsburg Limestone Co. (Ltd.)	60,000	75
3. Peoples Supply Co. (Ltd.)	10,008	75
4. Bessemer Electric Power Co	5,000	100
3. Mingo Coal Co	1,000	100
3. National Mining Co	500,000	66$\frac{2}{3}$
2. Pewabic Co	200,000	50
2, 6. H. C. Frick Coke Co	20,000,000	74+
1, 3. Pittsburgh S. S. Co	7,880,000	97+
3. Oliver Iron Mining Co	1,200,000	100
Subsidiary companies of foregoing.		
Of Union R. R. Co.:		
3. Monongahela Southern R. R. Co	160,000	100
Subsidiary companies of foregoing—Continued.		
Of H. C. Frick Coke Co.:		
3. Standard Water Co	$10,000	100
4. Sewickley Water Co	50,000	100
2. Hostetter-Connellsville Coke Co	1,500,000	87
Of Oliver Iron Mining Co.:		
2. Lake Superior Iron Co	2,100,000	75
2. Regent Iron Co	450,000	75
2. Security Land & Exploration Co	100,000	100
4. Braddock Iron Mining Co	30,700	100
4. Homestead Iron Mining Co	30,000	100
4. Duquesne Iron Mining Co	22,100	100
4. Allegheny Iron Mining Co	22,900	100
4. Hope Iron Mining Co	36,200	100
4. Neville Iron Mining Co	50,000	100
4. Monongahela Iron Mining Co	5,700	100
4. Lorain Iron Mining Co	50,000	100
4. Agawam Iron Mining Co	17,400	100
4. Great Western Mining Co	6,000,000	100
4. Ambridge Iron Mining Co	50,000	100
4. Morewood Iron Mining Co	50,000	100
4. Pencoyd Iron Mining Co	48,300	100
4. Munhall Iron Mining Co	50,000	100
4. Monessen Iron Mining Co	50,000	100
4. Somerset Iron Mining Co	50,000	100

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[1] The numbers refer to notes at the end of this exhibit (p. 414).

FEDERAL STEEL COMPANY (NEW JERSEY).

Capital stock: Common, $46,484,300; preferred, $53,260,900. Entire amount is owned by United States Steel Corporation.

The Federal Steel Company owns no property in fee. It controls the following companies through ownership of their capital stocks. The total capital stocks of said companies are as stated below.

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
2. Minnesota Iron Co.	$16,500,000	100
2. Illinois Steel Co.	18,650,600	100
2, 7. Elgin, Joliet & Eastern Ry. Co.	10,000,000	60
2. The National Tube Co. (of Ohio):		
Common	6,000,000	100
Preferred	3,000,000	100
3. The Lorain Steel Co.	3,000,000	100
3. The Lake Terminal R. R. Co.	2,000,000	100
3. Johnstown & Stony Creek R. R. Co.	91,500	100
3. Ingleside Coal Co. (Ltd.)	14,000	100
4. Indiana Steel Co.	20,000,000	100
4. Gary Land Co.	10,000	100
4. Connellsville & Monongahela Ry. Co.	700,000	100
2. H. C. Frick Coke Co. (for capitalization see Carnegie Steel Co.)	....	3+
4. Bunsen Coal Co.	10,000	100
4. U. S. Steel Products Co.	1,000,000	100
4. Minnesota Steel Co.	1,000,000	100
4. Interstate Transfer Ry. Co.	50,000	100
4. Spirit Lake Transfer Ry. Co.	65,000	100
4. Piloto Mining Co.	20,000	85
Subsidiary companies of foregoing.		
Of Minnesota Iron Co.:		
2. Chandler Iron Co.	80,000	51
2. Chapin Mining Co.	1,000,000	100
2. Winthrop Iron Co.	500,000	100
3. Alpha Ore Co.	500	100
3. Auburn Iron Co.	400,000	100
3. Beta Ore Co.	500	100
3. Bishop Iron Co.	57,000	100
3. Canton Iron Co.	50,000	100
3. Chippewa Iron Co.	27,000	100
3. Delaware Iron Co.	8,000	100
3. Elba Iron Co.	100,000	100
Subsidiary companies of foregoing—Continued.		
Of Minnesota Iron Co.—Continued.		
3. Fayal Iron Co.	$45,450	100
3. Genoa Iron Co.	9,000	100
3. Hugo Iron Co.	50,000	100
3. Manila Iron Co.	32,000	100
3. Norman Iron Co.	50,000	100
3. Northern Development Co.	100,000	100
3. Duluth & Iron Range R. R. Co.	3,000,000	100
Of Illinois Steel Co.:		
4. Universal Portland Cement Co.	1,000,000	100
4. United States Coal & Coke Co.	2,000,000	100
2. H. C. Frick Coke Co. (for capitalization see Carnegie Steel Co.)	....	10+
4. United Supply Co.	100,000	100
3. Cundy Iron Co.	50,000	100
4. Illinois Steel Warehouse Co.	100,000	100
3. Chicago, Lake Shore & Eastern Ry. Co.	9,000,000	100
3. Joliet & Blue Island Ry. Co.	100,000	100
3. Chicago & So. Eastern Ry. Co.	100,000	100
3. Chicago & Kenosha Ry. Co.	100,000	100
3. Milwaukee, Bay View & Chicago R. R. Co.	100,000	100
Of Gary Land Co.:		
4. Gary Heat, Light & Water Co.	100,000	100
Of U. S. Steel Products Co.:		
4. Isthmian S. S. Co.	£25,003	100

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[1] The numbers refer to notes at the end of this exhibit (p. 414).

AMERICAN STEEL AND WIRE COMPANY OF NEW JERSEY.

Capital stock: Common, $50,000,000; preferred, $40,000,000. All but 106 shares common and 10 shares preferred is owned by the United States Steel Corporation.

A very large part of the property of the American Steel and Wire Company is owned in fee. The company also controls the following subsidiaries:

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
4. American Steel & Wire Co. (of Alabama)	$100,000	100
3. American Steel & Wire Co. (of Colorado)	25,000	100
2. Trenton Iron Co	600,000	100
3. Canadian Steel & Wire Co	30,000	100
2. Griswold Wire Co	75,000	100
2. Troy Steel Products Co.	900,000	100
3. American Mining Co	1,000,000	100
3. American Land Co	200,000	100
2. Edgar Zinc Co	1,000,000	80
3. Pittsburgh & Ohio Valley Ry. Co	60,000	100
3. Northern Liberties Ry. Co	5,000	100
3. Newburg & South Shore Ry. Co	$1,500,000	100
3. Waukegan & Mississippi Valley Ry. Co	22,000	100
2. H. C. Frick Coke Co. (for capitalization see Carnegie Steel Co.)		11
4. United Coal Co. (for capitalization see A. S. & T. P. Co.)		25
2. Pennsylvania & Lake Erie Dock Co. (for capitalization see Carnegie Steel Co.)		18

[1] The numbers refer to notes at the end of this exhibit (p. 414).

NATIONAL TUBE COMPANY (NEW JERSEY).

Capital stock: Common, $40,000,000; preferred, $40,000,000. Entire amount is owned by United States Steel Corporation.

The greater part of the property of the National Tube Company is owned in fee. The company also owns the following stocks of subsidiary companies:

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
2. National Tube Works Co	$100,000	100
3. Benwood & Wheeling Connecting Ry. Co	50,000	100
3. McKeesport Connecting R. R. Co	1,000,000	100
2. H. C. Frick Coke Co. (for capitalization see Carnegie Steel Co.)		1
2. Pennsylvania & Lake Erie Dock Co. (for capitalization see Carnegie Steel Co.)		7+

[1] The numbers refer to notes at the end of this exhibit (p. 414).

AMERICAN SHEET AND TIN PLATE COMPANY (NEW JERSEY).

Capital stock: Common, $24,500,000; preferred, $24,500,000. All but 4 shares of each class of stock is owned by United States Steel Corporation.

In addition to the amount of capital stock as above, the American Sheet and Tin Plate Company has a capital surplus account of $46,325,000 arising from the merger of the American Tin Plate Company and the American Sheet Steel Company. In that merger the stock of the consolidated company remained the same as the stock of the American Sheet Steel Company previously was, thus resulting in the company having a capital surplus equal to the stock of the American Tin Plate Company in lieu of which no new stock was issued.

Nearly all of the property of the company is owned in fee. The subsidiary concerns are as follows:

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.	Subsidiaries.[1]	Amount of capital stock.	Percent owned by parent company.
2. W. Dewees Wood Co.	$1,500,000	100	3. Apollo Gas Co.	$100,000	100
Versailles Fuel Gas Co.	100,000	100	4, 8. United Coal Co.	60,000	75
McKeesport Terminal R. R. Co.	12,000	100	3, 9. National Mining Co.	....	33⅓
3. Elwood, Anderson & Lapelle R. R. Co.	50,000	100	2, 10. Sharon Tin Plate Co.	....	40½

[1] The numbers refer to notes at the end of this exhibit (p. 414).

AMERICAN BRIDGE COMPANY (NEW JERSEY).

Capital stock, $10,000,000. All owned by United States Steel Corporation.

In addition to the amount of capital stock as above, the American Bridge Company has a capital surplus account of $52,324,600 arising from reducing the par value of its capital stock from $62,324,600 to the nominal amount of $10,000,000.

The greater part of the property of the company is owned in fee. Its subsidiary companies are as follows:

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.	Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
4. American Bridge Co. (of New York)	$100,000	100	3. Pencoyd & Philadelphia R. R. Co.	$5,000	100
4. Empire Bridge Co.	3,000,000	100			
4. American Improvement Co.	2,500	100			

[1] The numbers refer to notes at the end of this exhibit (p. 414).

LAKE SUPERIOR CONSOLIDATED IRON MINES (NEW JERSEY).

Capital stock, $29,887,448.97. All owned by United States Steel Corporation.

The subsidiary companies of the Lake Superior Consolidated Iron Mines, and their capital stocks, are as follows:

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.	Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
2. Duluth, Missabe & Northern Ry. Co.	$4,112,500.00	100	4. Cambridge Iron Mining Co	$50,000.00	100
4,11. Proctor Water & Light Co.	250,000.00	100	4. Clarion Iron Mining Co.	50,000.00	100
3. Adams Mining Co.	220,000.00	100	4. Crawford Iron Mining Co	50,000.00	100
2. Spruce Mining Co.	66,000.00	100	4. Cumberland Iron Mining Co	50,000.00	100
2. Mountain Iron Co.	1,603,600.00	100	3. Essex Iron Co.	1,293,267.48	100
2. Great Northern Mining Co	3,500,000.00	99+	3. Roucheleau - Ray Mining Co.	95,000.00	100
2. Shaw Iron Co.	2,970,900.00	99+	3. Tubal Iron Mining Co.	50,000.00	100
2. Rathbun Iron Mining Co.	100,000.00	100	3. Owasco Iron Co.	50,000.00	100
4. Greenville Iron Mining Co	50,000.00	100	3. Oneida Iron Co.	50,000.00	100
2. Missabe & Northern Town Site Co.	6,900.00	100	3. Seneca Iron Co.	50,000.00	100

[1] The numbers refer to notes at the end of this exhibit (p. 414).

UNION STEEL COMPANY (PENNSYLVANIA).

Capital stock, $20,000,000. All owned by United States Steel Corporation.

The Union Steel Company owns a considerable amount of property in fee.

The subsidiary companies (which hold a large portion of the property) and their capital stocks are as follows:

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.	Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
3. Sharon Coke Co.	$2,510,000	100	3. Girard Land Co.	300,000	100
3,12. Republic-Connellsville Coke Co.	2,500,000	100	3. Sharon Land Co.	5,000	100
3. Sharon Ore Co	5,000,000	100	2. Sharon Tin Plate Co.	800,000	59½
3. Donora Mining Co.	6,000,000	100	3. Matthews Woven Wire Fence Co.	49,000	100
3. Mercer Valley R.R.Co.	275,000	100	3. Sharon Coal & Limestone Co.	300,000	66⅔
3. Donora Southern R.R. Co.	40,000	100			

[1] The numbers refer to notes at the end of this exhibit (p. 414).

CLAIRTON STEEL COMPANY (PENNSYLVANIA).

Capital stock, $3,500,000. All owned by United States Steel Corporation.

The greater part of the property of Clairton Steel Company is owned in fee. Its subsidiary companies and their capital stocks are as follows:

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.	Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
3. St. Clair Terminal R. R. Co.	$1,000,000	100	2. Champion Iron Co.	$498,750	100
3. Clairton Land Co.	1,000	100	3. St. Clair Limestone Co.	25,000	51

[1] The numbers refer to notes at the end of this exhibit below.

TENNESSEE COAL, IRON AND RAILROAD COMPANY (TENNESSEE).

Capital stock: Common, $32,529,997.50; preferred, $124,500; guaranteed preferred (Alabama Steel and Ship Building Company), $178,600. All of the common stock, except $87,202.50, is owned by the United States Steel Corporation, but none of the preferred or guaranteed preferred stock is owned by the United States Steel Corporation.

The great bulk of the property of the Tennessee Coal, Iron and Railroad Company is owned in fee; the company has, however, the following subsidiaries:

Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.	Subsidiaries.[1]	Amount of capital stock.	Per cent owned by parent company.
2. Birmingham Southern R. R. Co.	$1,200,000.00	100	3. Ensley Land Co.	$450,163.75	57+
3. Tennessee Land Co.	10,000.00	100	3. Potter Ore Co.	800,000.00	50

[1] The numbers refer to notes at the end of this exhibit below.

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[1] The United States Steel Corporation also owns $221,700 (par value) of the stock of the Pittsburgh Steamship Company, the balance of the stock being owned by the Carnegie Steel Company.

[2] Companies which were independent concerns prior to the time control or ownership thereof passed to the parent company now controlling or owning same.

[3] Companies which were promoted and organized in the interest of their respective parent companies, in the extension of the latter's business, prior to the date the United States Steel Corporation acquired control of the said parent companies.

[4] Companies which have been promoted and organized in the interest of their respective parent companies, in the extension of the latter's business, since the time the United States Steel Corporation acquired control of said parent companies.

[5] American Steel and Wire Company and National Tube Company also own stock of this company, giving an ownership by United States Steel interests of 77.9 per cent of total.

[6] The remaining 26 per cent of Frick Coke Company stock is owned by other companies controlled by the United States Steel Corporation, viz: National Tube Company, 1 per cent; American Steel and Wire Company, 11+ per cent; Illinois Steel Company, 10+ per cent; Federal Steel Company, 3+ per cent. Thus the entire stock of Frick Coke Company is owned by United States Steel interests. In addition to its outstanding stock of $20,000,000 the Frick company has a capital surplus of $4,871,231.30 arising from merger of companies.

[7] The remaining 40 per cent of this company's stock is owned by the Chicago, Lake Shore and Eastern Railway Company, a subsidiary of the Illinois Steel Company.

[8] Balance of stock owned by American Steel and Wire Company.

[9] See Carnegie Steel Company for particulars of stock, etc.

[10] See Union Steel Company for particulars of stock, etc.

[11] Authorized amount.

[12] This company has also a capital surplus of $2,000,000 arising from merger of companies.

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REPORT

OF THE

COMMISSIONER OF CORPORATIONS

ON

THE STEEL INDUSTRY

PART II

COST OF PRODUCTION

PRELIMINARY REPORT

JANUARY 22, 1912

DEPARTMENT OF COMMERCE AND LABOR
UNITED STATES OF AMERICA

WASHINGTON
GOVERNMENT PRINTING OFFICE
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LETTERS OF TRANSMITTAL.

Department of Commerce and Labor,
Office of the Secretary,
Washington, January 22, 1912.

Sir: I have the honor to transmit herewith Part II of the Report of the Commissioner of Corporations on the Steel Industry, being in the nature of a preliminary report and dealing with the cost of production in the steel industry.

Respectfully,
Charles Nagel,
Secretary.

The President.

Department of Commerce and Labor,
Bureau of Corporations,
Washington, January 22, 1912.

Sir: I have the honor to transmit herewith Part II of a Report on the Steel Industry, made to the President under your direction and in accordance with the law creating the Bureau of Corporations. This is in the nature of a preliminary report, and deals with the cost of production in the steel industry.

I desire to mention as especially contributing, under my direction, to the preparation of this part the name of Mr. Francis Walker, one of my assistants.

Very respectfully,
Herbert Knox Smith,
Commissioner.

To Hon. Charles Nagel,
Secretary of Commerce and Labor.

LETTER OF SUBMITTAL.

Department of Commerce and Labor,
Bureau of Corporations,
Washington, January 22, 1912.

Sir: I have the honor to submit a report on the cost of production of iron and steel.

The cost of steel making is a basic industrial fact, which bears on tariff legislation, prices and profits in a great industry, and the concentrated control of a great natural resource.

The Bureau has used the actual records of companies covering, roughly, two-thirds of the country's production of iron and steel for 1902 to 1906. These data are most complete. More limited figures for 1902 to 1910 make it clear that these five-year figures substantially represent present conditions also.

The costs of the United States Steel Corporation for the chief materials and products are also given for 1910.

During 1902 to 1906 the steel industry was based on Lake ore, but very low costs for Southern pig iron appear in the report.

"BOOK COSTS" AND "INTERCOMPANY" PROFITS.

Many of these companies were highly "integrated;" that is, they linked up under one control, through various subsidiaries, ore mines, blast furnaces, steel works, etc. Their "cost sheets," however, did not correspond with this integration. The costs of each subsidiary were shown as though it were independent, and *included profits paid to other subsidiaries.* To illustrate, one subsidiary of a combination, operating blast furnaces, would pay to another subsidiary, which mined ore, a price for ore that included a profit to the ore company. This price would, however, be entered by the furnace company as a part of its costs. That is, they were "book costs," and they included considerable profits really received by the same interests.

These intermediate profits are very important. For example, the average "book cost" of Bessemer pig iron over the five-year period was $13.89 per ton. "Transfer" profits were $1.79, leaving a net cost of $12.10. (Gross tons are used throughout, except where otherwise specified.)

The Bureau deducted these intermediate "transfer" profits for all the important simpler products. The resulting "revised cost" must, however, be handled with great caution. The margin between this revised cost and the selling price is, of course, much larger than the margin over the "book cost;" but, on the other hand, that larger margin must cover all the stages of production, and therefore a much larger investment. The profit above the "book cost" of a subsidiary is to be applied simply to the investment of that company. On the other hand, the profit above the revised cost of an integrated company, carrying through many stages of production, *must be set against that entire investment*.

The Bureau has presented the cost data, combined for a number of companies, in two forms for each product: (1) It gives first the average book cost thereof; (2) it has then deducted the average intermediate "transfer" profits, thus showing the revised cost.

One of these companies, the United States Steel Corporation (hereafter referred to as the Steel Corporation), has also large intercompany profits on transportation, chiefly in carrying its ore on its own railroads. In the Steel Corporation's costs, which are given later, these "transportation" profits are also deducted; but not here. Only the Steel Corporation has such profits to any considerable degree, and to deduct them in the present combined figures would give an average for all companies which would be true neither for the Steel Corporation nor for the other concerns.

CUMULATIVE EFFECT OF COST OF ORE.—A fundamental fact is the cost and profit on ore. Ore is the raw material for iron and steel, and its costs have an underlying and cumulative effect through all stages of production and ultimately on the prices of the finished product. The report shows that there were high intermediate profits on ore going into pig iron, with marked cumulative effect on all finished products.

COST OF STEEL RAILS.

It is impossible to give here the detailed cost figures of the full report. Simply the general principles are stated, the nature of the information, and its more striking relations to the public interest. An illuminating view of costs in general, however, can be had from an outline of steel-rail production and costs.

Starting with the chief raw materials, ore and coke, the "book cost" of ore for the five-year period was $2.64. The only "transfer" profit in the cost of ore itself was an intercompany royalty of $0.02 per ton, leaving a net average cost of ore of $2.62.

For Connellsville coke, the principal kind used, the cost was $1.43 (net ton), with no intermediate profits.

Passing now to the next step, Bessemer pig iron. Intermediate profits in ore and in coke, as they go into pig iron, are large. Furthermore, these costs, profits, and freights to the furnace are multiplied because it takes about 1.8 tons of Bessemer ore and over 1 net ton of coke for 1 ton of pig iron. The average book cost of the ore for 1 ton of pig iron was $7.36; coke, $3.81; and limestone, $0.43. The so-called "cost above materials," necessary for converting that ore into pig iron, was: Labor, $0.73; other operating cost, $0.80; and depreciation and general expense, $0.76. The total makes a book cost of pig iron of $13.89. Taking out now the transfer profit, $1.79, there is left a net cost of $12.10.

Advancing to Bessemer rail ingots, there appears a book cost of $17.59. All the preceding intermediate profits, however, have been carried forward in the book cost of the raw material, pig iron. Thus, the total "transfer" profits for ingots were $1.84, leaving a net ingot cost of $15.75.

For heavy Bessemer rails, finally, the book cost was $21.27. This is based on the book cost of ingots. The final transfer profits were $2.47. Deducting these leaves $18.80 as the revised cost. The total difference is thus a very considerable amount. About one-fourth of this revised cost was for labor in all stages of production, as appearing directly in the cost sheets.

In the text, the general principles and form of presentation for other products are the same as for rails.

RAIL INVESTMENT.—The relation of these integration profits to entire integration investment may be roughly illustrated here. The price of Bessemer steel rails has been fixed for over 10 years at about $28 a ton. The cost, eliminating transfer (but not transportation) profits, is $18.80 per ton. This leaves a margin of $9.20. The total mining and manufacturing investment (excluding transportation properties) actually behind this steel-rail production, from ore to rails, is from $80 to $55 a ton. On this investment the margin, $9.20, represents a profit of from about 11 to 17 per cent. The margin between revised cost and price must in this way be distributed over the entire investment thus attributable to the product in question.

LARGE AND SMALL COMPANIES—BILLETS.—A significant fact is the difference between the costs of large companies, which are well integrated, and small companies, which are not. A good example here is Bessemer billets. In this product intermediate profits have also accumulated through ore, coke, pig iron, etc. For the group of large companies the book cost of billets was $19.89; for small companies, $22.54. The difference was $2.65. But now taking out transfer profits, the cost for large companies was $17.56, and for small companies $21.69, a difference of $4.13 between the two. The large companies represented here included the Steel Corporation, the Republic, Lackawanna, and Jones & Laughlin steel companies.

Part of this difference in favor of large companies must, of course, cover a greater investment, due to higher integration; part is due to superior efficiency resulting from such integration; but part represents also monopolistic control, especially in ore.

In so far as this difference means a larger per cent of return on each dollar of investment, it is a real difference in industrial position between the two groups. This difference must be considered in any public action affecting both classes of companies.

OTHER PRODUCTS.—The Bureau has not attempted to revise these costs beyond the simpler finished products. As the elaboration increased, the difficulties of revision increased disproportionately. The chief intermediate profits, however, are in the raw materials, ore and coke, and certainly largely included in the pig iron. Accordingly, they are necessarily carried forward into all finished steel products.

A broad survey of "book costs" of steel products can, however, be obtained from the following table. These costs *have not been revised,* and therefore include considerable transfer profits.

UNREVISED BOOK COSTS.

Products.	Total cost.	Products.	Total cost.
Open-hearth billets	$20.87	Wire rods	$27.21
Universal plates	21.82	Bright coarse wire (net tons)	29.12
Structural	26.52	Black sheets (net tons)	39.37
Merchant bars	28.12	Tin and terne plate	71.23

INTEGRATION COSTS OF UNITED STATES STEEL CORPORATION.

For the foregoing combined costs of a number of concerns the Bureau computed the revised costs. But for the Steel Corporation the Bureau received, from the Corporation itself, its book costs of various products and the record which it kept of its own intermediate profits on such products for the year 1910.

Its intermediate profits are the highest and its net costs are the lowest. This fact, and its unique character and dominating position, make the costs of this Corporation a matter of public importance.

The Steel Corporation is by far the most highly integrated concern in the industry. It not only makes pig iron, steel, and most of the various rolled products, besides some more elaborated articles, but it also mines its own ore and coal, produces its own coke, and does all this more completely than any competitor. Finally, it links up its ore mines with its furnaces by its own rail and vessel lines and dock companies. In its control of ore railroads, both north and south of the Lakes, it stands in a class by itself. For this reason its "transportation" profits, as well as transfer profits, are here deducted to show its net or "integration" costs.

The results of this integration and of the Corporation's position in the industry are shown by its total integration costs, as follows:

Integration cost of ore, when mined and transported to lower Lake ports, $2.40. The book cost was $2.88.

Bessemer pig iron, integration cost, $10.21. The book cost was $14.39. Included in both cases is an item of general expense and depreciation—"additional costs"—approximated at $0.50.

Bessemer rail ingots, integration cost, $12.77. Book cost, $17.45. (Including in both cases "additional costs" approximated at $0.60.)

Heavy standard Bessemer rails, integration cost, $16.67. Book cost, $21.53. (Including in both cases "additional costs" approximated at $1.30.) The difference here, $4.86, is about equally divided between transportation profit and transfer profit. This division for rails gives a general idea of the importance of transportation profits.

These integration costs are the lowest in the domestic industry. They can not, however, be compared with the combined figures previously given for 1902 to 1906, because of the difference in the kinds of profit eliminated, the difference in dates, and the difference in companies.

The intermediate profits which were eliminated to reach these low costs are the largest per ton in the industry. But they must be set against the most extensive investment per ton of product. The margin between these costs and selling prices must cover a return on all the agencies of mining, transportation, and manufacture, from the ore and coal to the finished product.

PROFITS ON RAILROADS AND ORE RESERVES.

The most significant profits were those on ore and on railroad transportation. In so far as the Steel Corporation enjoys monopolistic power, it lies chiefly in these two factors.

The Bureau's revisions indicate a rate of profit of about 10 per cent (for the period 1902 to 1906) on the average total investment of the Steel Corporation in ore (as estimated by the Bureau in Part I of this report, already issued). Whether such a rate of return is reasonable in itself is not of first importance. The essential fact is that 10 per cent profit is earned on the whole ore holding. Thus, while earning 10 per cent, the Steel Corporation can also carry a vast ore reserve far in excess of its present requirements and so large as to have distinctly monopolistic features, can exercise on the entire industry the undefined but real power that such concentration of the ultimate resource must give, and can assure itself of the certain increment of value that will inevitably occur with the diminishing of our available ore supply so long as the existing conditions of concentration are allowed to continue.

The ore rates on its two ore railroads have been excessive. In so far as they exceed a reasonable return, they not only benefit the Corporation by a high profit on the ore of other shippers, but correspondingly handicap the business of such competitors, who must ship over these roads. These rates were reduced in November, 1911.

Such control of public agencies of transportation by an industrial corporation carries with it just such possibilities of abuse, and raises the question whether the public interest in this industry does not require a segregation of the ore railroads of the Steel Corporation.

Very respectfully,

Herbert Knox Smith,
Commissioner of Corporations.

The President.

REPORT OF THE COMMISSIONER OF CORPORATIONS ON THE STEEL INDUSTRY.

Part II.—COST OF PRODUCTION (PRELIMINARY REPORT).

CHAPTER I.

SUMMARY OF RESULTS.

Certain salient points are brought out by this investigation of costs. These points will be discussed in detail, but for convenience are here stated in summary form, as follows:

1. That cost statements for iron and steel products vary greatly on account of differences in scope of operations and in legal organization and accounting methods of different companies. Therefore, the statement and use of such cost data require the most careful discrimination.

2. That the "book costs" of highly integrated concerns (that is, those companies which link up under one control successive stages of production of materials and finished commodities) are not net costs, because they include large items of intermediate profit. These profits occur as the materials pass from one stage of production to another, because these materials are transferred from one department or subsidiary to another at market prices or at arbitrary "transfer" prices, instead of at cost.

3. That the average costs differed greatly, according as such intermediate profits were included or excluded. For example:

Products.	Cost including all intermediate profits.	Cost excluding intermediate transfer profits on materials.[1]
Lake ore	$2.64	(²)
Bessemer pig iron	13.89	$12.10
Large Bessemer billets	20.11	17.90
Bessemer standard rails	21.27	18.80

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[1] This cost does not exclude, however, transportation profits, which are considerable in amount for the Steel Corporation, as explained later. (See p. 70.)

[2] No difference except for a trifling amount of intercompany royalty.

The above are average costs for companies having a very large proportion of the total production in the United States for the five years 1902 to 1906.

4. That if all these companies are divided into two groups—large companies which were all highly integrated, and small companies which generally were not well integrated—the average costs of the two groups differed decidedly. These differences were more marked when intermediate profits were excluded. For example:

Products.	Cost including all intermediate profits.		Cost excluding intermediate transfer profits on materials [1]	
	Large companies.	Small companies.	Large companies.	Small companies.
Lake ore	$2.67	[2] $2.49	(3)	(3)
Bessemer pig iron	13.86	14.27	$11.93	$14.21
Large Bessemer billets	19.89	22.54	17.56	21.69
Bessemer standard rails	21.27	....	18.80	....

[1] This cost does not exclude, however, transportation profits, which are considerable in amount for the Steel Corporation, as explained later. (See p. 70.)

[2] See pp. 46–47.

[3] No difference except for a trifling amount of intercompany royalty.

These differences between the two groups are, of course, largely due to the fact that the more steps in production controlled by one concern the more intermediate profits go to that concern, instead of being paid to outsiders. Accordingly, when intermediate profits are excluded, the net cost for an integrated concern is less than for one not so highly integrated. It should be observed that the above cost figures show costs simply exclusive of transfer profits on materials, and not exclusive of transportation profits. Such transportation profits are earned by certain large companies, and above all by the Steel Corporation.

5. That while highly integrated concerns have a lower net cost than nonintegrated concerns, and therefore a higher margin (not rate) of profit between costs and prices, yet, on the other hand, being so integrated, they have a larger investment to be covered by this margin of profit over net cost.

6. That the costs for this period (1902 to 1906, inclusive) are substantially representative of present conditions. This is shown by a comparison of costs for a number of important selected plants for several products from 1902 to 1906, inclusive, and for 1910.

7. That the United States Steel Corporation has a special advantage in cost of production on account of its more complete integration, particularly in producing all the ore and coke it uses, and in having railroads for ore transportation, which branches of its business

yield great profits. The costs of the Steel Corporation are especially reduced if these intermediate profits are excluded, as is shown by the following examples for 1910:

Products.	Book cost.	Integrated cost excluding intercompany profits on materials and transportation.
Lake ore	$2.88	$2.40
Bessemer pig iron	14.39	10.21
Bessemer standard rails	21.53	16.67

In considering these integration costs of the Steel Corporation the much more extensive and diversified investment of that company should also be taken account of. The importance of this investment factor is clearly brought out in this report.

8. That the indicated investment per ton of product for Bessemer steel rails for the period 1902 to 1906, taking conditions of business then prevailing, ranged from $80 to $55 per ton of rails. On the basis of a price of $28 per ton of rails the profit for all companies whose costs (excluding transfer profits only) are shown above ($18.80 per ton) would be from 11 to 17 per cent on the investment.

9. That the prices of Lake ore have been kept for many years at an unreasonably high level compared with the cost of production and the cost of the investment in the producing ore properties. Consequently, integrated concerns, transferring such ore to the pig-iron producing departments of the business at those high prices, necessarily show an unduly high book cost for pig iron and for various steel products made from pig iron.

10. That this policy in regard to ore prices has two important results. For companies selling ore it tends to make remunerative the investment in vast ore reserves which are not at present utilized, and to unduly enhance the value of such properties. It also tends to make the cost of iron ore excessively high to companies which must purchase it in the open market, and thus prevents them from becoming effective competitors in pig iron or in steel products made therefrom.

CHAPTER II.

THE COST PROBLEM AND SCOPE OF REPORT.

Section 1. The importance of costs of production.

The question of the cost of production is obviously of great public interest in connection with industries which, like the steel industry, enjoy the benefit of protective tariff duties. It is also important in connection with profits, particularly with respect to the profits made in the several branches; that is, for ore, pig iron, and various products of steel. This matter is of special significance because the steel industry is based on a natural resource the control of which is characterized by certain monopolistic features.

As the various iron and steel making enterprises differ in their control of such natural resources, their costs and profits likewise naturally show large differences. The concern which enjoys very large profits in a prior stage of the business which are not enjoyed by a competitor, even though their subsequent costs for similar products are substantially equal, is able to put such competitor at a great disadvantage.

Section 2. Problem of stating costs of production.

Production costs of various iron and steel products and of the several raw materials differ widely for different concerns, not only on account of the ordinary variations in skill or good fortune in management, advantages in location, investment, etc., but also particularly because of the following two factors:

1. Differences in scope of operations or degree of integration.
2. Differences in legal organization and accounting practice.

Differences in scope of operations or integration.—The differences in scope of operations of different concerns are a fundamental fact which affects the net or absolute costs of production. Some concerns are highly "integrated;" that is, their operations cover the production (and sometimes even the transportation) of the raw materials, and the succeeding stages of manufacture of crude and finished products. Other concerns are not integrated at all, or only in a comparatively small degree. Such concerns must therefore purchase raw materials—as, for example, ore and coke for making pig iron, from other producers at prices which are generally considerably higher than the cost of producing them. Other things being equal, the integrated enterprise has therefore a lower cost of production than the nonintegrated enterprise. On the other hand, it has also, of course, a larger investment.

It is absolutely essential to keep this investment factor clearly in mind in any study of costs. This point can hardly be overemphasized. Costs and prices by themselves afford no criterion whatsoever for judging profits unless the extent of the investment is also taken into consideration; that is, if a company is highly integrated, so that its business extends over a large number of steps in the production of steel, its profits must also extend over all its investment in those various processes, and should be commensurate with such investment.

DIFFERENCES IN LEGAL ORGANIZATION AND ACCOUNTING PRACTICE.—The legal organization of enterprises has often a very important effect on the book costs of production, particularly if such enterprises are highly integrated. Concerns which embrace mining operations, transportation, and manufacturing frequently organize separate companies for these different branches. Sometimes the laws require such separation in legal organization, as, for example, for railroads and certain mining enterprises. Under such conditions it is usually the case that the products or services are sold by one subsidiary to another subsidiary at prevailing market prices, or at arbitrary "transfer" prices, which ordinarily include a profit over and above the actual cost to the first concern. Hence, from the standpoint of the accounts of the subsidiary company, it is of course necessary to include the prices thus paid in its own general profit and loss accounts, and likewise, therefore, in its cost accounts, which when correctly kept are an integral part of the profit and loss accounts. If these several branches of the concern were put under the direct operation of one company, there would be no necessity for charging market prices instead of actual costs. Nevertheless, this is sometimes done. For example, a company making pig iron, crude steel, and finished steel products may transfer its pig iron from its blast furnaces to its steel-making department at a price which includes a profit, just as though it were selling it to some outside interest. While of course this increases the book cost of making steel on the cost accounts of the steel department, obviously it does not increase the real cost to the company as a whole.

The costs as kept by the various subsidiaries of an integrated organization may, for convenience, be referred to as "book costs" as distinguished from revised costs, from which the intermediate or so-called "intercompany" profits have been eliminated.

The differences in cost due to the legal organization of a given concern, or group of productive activities which belong to a single private interest or group, or to merely technical differences in methods of cost accounting, are, however, of little public interest, and their elimination shows what the costs are for a given enterprise taken as a whole, and this is much more significant. In fact, this is the only satisfactory way of reaching a real or significant cost in the steel industry as it now exists. Obviously costs which are affected by legal or arbitrary divisions of one business are likely to be more or less artificial.

It is evident that the problem of cost of production embraces two stages of discussion—(1) book costs, the costs as shown by the accounts of the companies, and (2) net costs, i. e., the costs after the elimination of intermediate profits.

Section 3. Significance of investment.

In whatever form the costs of a concern are stated, the significance of the cost and of the margins between cost and selling price can not be fully appreciated without taking into account the investment in plant and other capital utilized in that part of the production for which the cost is stated. Thus, in the case of a concern comprising in a single organization ore mines, coke works, and blast furnaces, the cost accounts for pig iron may represent the net cost, without any allowance for profit on the ore or coke. Therefore the margin between such cost and the selling price of pig iron would constitute the return on the investment, not only on the blast furnaces, but also on the ore mines and coke works. On the other hand, in the case of an enterprise having separate companies for each of these stages of production, the margin between its book cost and the selling price of pig iron would state the return on the investment for blast furnaces only, because the blast-furnace company would take over the ore and coke at a price that would pay a profit to the ore and coke companies. Assuming that in each instance the technical conditions are similar, and the operations are conducted with equal efficiency, it is obvious that there should be a larger margin in the case of the first company than in the case of the second.

If these intermediate profits were known to represent simply a fair return on the investment, there would be perhaps no necessity for eliminating them (except for the reason that not all companies have their costs computed on the same basis). The conditions of competition, and particularly with respect to the exploitation of natural resources and the control thereof, might conceivably be such that it could be safely assumed that the profits were reasonable.

As a matter of fact, however, the profits in certain branches of the business, notably in the production of Lake ore, are regarded by the Bureau as unreasonably high. This is largely due to monopolistic control of production and to price understandings among ore producers. Hence, the only satisfactory way to present the costs of pig iron and products made therefrom is to eliminate any profit on ore which enters therein, and then to present such data as are available for judging what a reasonable profit would be.

Investment has an important relation to cost and the margin of profit in another way, namely, where the costs of two concerns for a given product start on the same basis with respect to the degree of integration of the enterprise but where one concern has invested in plant and equipment a much greater amount of capital than another concern of equal capacity, with a view to reducing its operating costs, as, for instance, in the introduction of labor-saving devices. In this case also the margin between cost and price tends to be larger, and must necessarily be larger, in order to afford an equal rate of return to the increased investment.

Section 4. Scope of the cost statements in this report.

The cost data obtained by the Bureau and the cost statements presented in this report may be divided into three parts:

(1) Cost statements for the years 1902 to 1906, inclusive, which relate to a very large proportion of the total production of the United States for the chief raw materials and products of the iron and steel industry.

(2) Cost statements, showing comparative costs, for the years 1902 to 1906, inclusive, and for 1910, for the chief raw materials, and for pig iron, and selected steel products, at a number of typical and important plants. For ore the average costs are shown for the years 1902 to 1910, inclusive.

(3) Cost statement for the year 1910 for the Steel Corporation, for the chief raw materials, pig iron, and certain steel products.

The first statement gives a broad view of the costs in the industry as a whole over a considerable period of time. On account of its elaborate character it was impracticable to bring it down to date. It shows the costs as given on the books of account for raw materials, pig iron, and selected steel products. It shows also the costs after the elimination of intermediate transfer profits (but not intermediate transportation profits; see p. 70), with respect to raw materials, pig iron, and selected steel products. It also distinguishes the costs of the larger and well-integrated companies (for which such profit eliminations are important) from the costs of the smaller companies.

The second statement shows the relative position of costs as between 1902 to 1906 and 1910. Although not representative of the average costs for the industry as a whole, it affords a fair basis for determining whether there have been any essential changes in the conditions of production in recent years which would affect the representative character of the average costs for 1902 to 1906 given in the first statement. As this statement is used for comparative purposes only, the costs are shown as given on the books of account without the elimination of intermediate profits. Its value for comparisons lies not so much in the final costs of the manufactured products as in the costs of raw materials (ore and coke) and in the "cost above materials" of manufactured products. The term "cost above materials" is the technical term for all the operating costs except the raw material used in the process in question, and will be used in that sense in this report.

The third statement shows the position of the United States Steel Corporation in 1910 with respect to cost of production. The costs of this company are given as shown by the books of account, and also after the elimination of approximate intercompany profits, as shown by the records of the Corporation. In this case intermediate transportation profits on materials as well as transfer profits are eliminated. The costs of the Steel Corporation are the only ones given for an individual company, and this distinction is made simply on account of its unique position in the industry, particularly with respect to the supply of raw materials and the facilities for transporting them.

The Bureau made a comprehensive investigation into the costs of the raw materials and finished products of the iron and steel industry in the United States, the principal results of which are presented in this report. It also attempted to get similar costs of manufacture in the chief foreign producing countries, but while much information of a general character was obtained relating to the subject it was found impossible to obtain any comprehensive information as to the costs as shown directly on the books of account.

The cost sheets and other statements relating thereto which were furnished by the concerns whose costs are discussed in this report were verified by an examination of their books of account.

CHAPTER III.

AVERAGE BOOK COSTS OF CHIEF RAW MATERIALS AND PRODUCTS OF IRON AND STEEL, 1902-1906.

Section 1. Extent and character of data.

The first of the two forms of statement for 1902 to 1906 is now to be presented, that of the book costs. The cost data for this period cover, with but few exceptions, from 70 to 90 per cent, or more, of the total United States production of the respective products discussed, as follows:

TABLE 1.—COMPARISON OF TONNAGES OF PRODUCTION OF SPECIFIED RAW MATERIALS AND PRODUCTS COVERED BY THE COST STATEMENTS, WITH TOTAL TONNAGES PRODUCED IN THE UNITED STATES, 1902-1906.[1]

[Gross tons.]

Products.	Total tonnage produced in the United States.	Total tonnage covered by cost statements.	Per cent covered by cost statements.
Lake Superior ore	144,950,375	106,268,728	73.3
Total ore	188,493,634	126,980,827	67.4
Coke (net tons)	142,969,463	72,963,407	51.0
Bessemer pig iron	55,729,369	51,902,699	93.1
Basic pig iron	15,686,273	9,573,539	61.0
Total pig iron (including ferro and spiegel)	100,627,163	68,333,635	67.9
Bessemer ingots	48,706,135	48,586,761	99.8
Basic open-hearth ingots	30,946,392	24,731,706	79.9
Total steel ingots	83,766,238	75,228,009	89.8
Large and small Bessemer billets [2]	....	20,594,739	....
Heavy steel rails [3]	14,291,041	14,020,303	98.1
Plates and sheets	15,400,858	10,670,397	69.3
Structural shapes	7,124,576	4,417,872	62.0
Wire rods	8,457,078	6,867,310	81.2
Black plates (included in plates and sheets)	2,412,630	2,091,615	86.7
Tin and terne plates	2,369,270	1,714,464	72.4

[1] The figures of production in the United States, except in the case of ore and coke, are those reported by the American Iron & Steel Association.

[2] Statistics of the country's total production of billets are not available. It is believed, however, that the Bureau's cost data for Bessemer billets cover over 90 per cent of the total production of the country during the period stated.

[3] The production of heavy rails, as given by the American Iron & Steel Association, includes a small quantity of girder rails, while that reported in cost statements for the Bureau includes no girder rails, but does include a small tonnage of light rails. Owing to these differences in classification, the exact percentage for standard rails can not be computed, but practically 100 per cent of the production of such rails is covered by the Bureau's figures.

These percentages for ore, coke, and total pig iron are somewhat misleading if applied to the steel industry proper, since a considerable part of the total tonnage of these products was not used to make steel. Thus, a part of the total production of ore was used for the manufacture of foundry iron, and in the case of Southern ore from 1902 to 1906 hardly any at all for the manufacture of steel. Similarly, a large amount of the total production of pig iron was used for foundry purposes and not for the manufacture of steel products. The total production of coke included, of course, very large quantities not utilized in the iron and steel industry at all, which explains the exceptionally low percentage for that product. Of coke used in iron and steel manufacture, the cost data obtained by the Bureau probably represent about 60 per cent.

For Bessemer pig iron and Bessemer ingots, which were the chief basis of steel manufacture from 1902 to 1906, and also for steel rails, practically the total output of the country was included in the cost statements, while for most other important branches of steel production the proportion included was two-thirds or more of the total.

The companies whose costs are comprised in these cost statements include the United States Steel Corporation (referred to hereinafter as the Steel Corporation or the Corporation) and all the large steel-making companies (with one or two exceptions) which are chiefly engaged in making ordinary commercial products of steel. A considerable number of concerns of lesser importance, including some of distinctly small operations, are likewise embraced in the cost averages.

In furnishing their costs the several companies generally rendered statements showing simply the mine, furnace, or mill costs, which often included, as already explained above, various intermediate profits for materials produced by the same interests and taken over at market prices or at arbitrary transfer prices instead of at cost. Their costs as reported generally did not include, however, an allocation of general expenses and general depreciation of the several companies to their respective costs for particular products. These undistributed expenses were shown in their profit and loss accounts. The Bureau allowed for and included these items of "additional cost" not shown in the regular cost sheets. These items, except for the ore and coke companies, could not be allocated to particular products of such companies according to any perfect rule; but the plan adopted by the Bureau was to increase the mill costs of the several products in the same proportion as such additional costs increased the total manufacturing and producing costs of the several companies for all products. While this method tends to give an appearance of excessive additional costs—as, for example, depreciation—for the more highly manufactured products, this is not really the case, because this figure is for each successive product a cumulative one and covers all the depreciation allowances for previous stages of production not comprised in the cost of the material as given in the cost sheet for the product in question. This point, however, can be better explained later on when these additional costs are shown.

On the other hand, there is no doubt that an arbitrary rule of this character does not give very satisfactory results in allocating the expenses and depreciation really incurred with respect to particular products. The merits of this method will be discussed in more detail later. (Cf. p. 24.) At this place it is desirable to point out the advantage of it, namely, that it is simple and automatically provides that all these actual expenses or charges to depreciation shall be covered in the statements of cost. It does not preclude, however, the use of estimates for such additional costs based on normal experience rather than on a mathematical rule.

The cost of a product so arrived at is referred to in this report as the total cost to distinguish it from the mine, furnace, or mill cost.

In connection with the costs of production of the several raw materials and products, the Bureau also obtained, from the several companies which reported, profit and loss statements showing the average proceeds of sale or transfer, together with the profit thereon. While this material incidentally furnishes another and usually slightly differing figure of cost (due chiefly to the fact that the quantities in question are not exactly the same), it is chiefly important in what it shows regarding the rate and amount of profit on the products of each of the several stages of production. The "additional costs" already described were used by the Bureau in the same manner to increase the reported cost of sales as to increase the mill costs.

The costs for the period 1902 to 1906 are given herein invariably by the method of true averages for the companies whose costs are combined; i. e., the amounts of every item of cost are added together and divided by the total quantity of the product to get the cost per ton, whether for items of cost or total costs.

The cost sheets as furnished by the several companies were, of course, by no means uniform with respect to classification of items. Most of them also showed the items in far too great detail for the purposes of this report. The numerous detail items were grouped by the Bureau, therefore, under a comparatively few simple heads. The full text of this report will discuss these items in some detail, at least for the chief raw materials and products. But it is impossible to give any consideration to such details in this summary except with respect to a few fundamental facts, necessary for a proper understanding of the data presented, particularly in the elimination of intermediate profits from costs of production.

However, in order to make clear the detailed character of the information furnished by the several companies, a typical cost sheet of one company for a single product is given below. This cost sheet is not given for a single blast furnace, but for a group of furnaces at a single plant. The title of the cost sheet has, therefore, been slightly changed. Furthermore, in place of the description of ores given in the original cost sheet, the letters A, B, C, etc., have been substituted in order not to reveal the identity of the company whose pig-iron cost is stated. Again, certain items appear in red ink in the original, but are shown in bold-face type here.

[Typical cost sheet; to show form only.]

—— COMPANY. —— FURNACE PLANT. COST OF PRODUCING BESSEMER PIG IRON AT ALL FURNACES DURING YEAR 191—.

Items. (Mesaba ores to be entered separately from other ores and totals of each shown in red ink.)	Per cent metallic contents.	Gross tons.	Price.	Amount.	Material per ton.		Cost per ton.
					Pounds.	Per cent.	
A.....ore		131,784	$4.93	$649,531.59			
B.....do		349,041	4.80	1,675,216.06			
C.....do		46	4.30	197.67			
D.....do		55,606	4.83	268,358.39			
E.....do		29,439	4.98	146,680.57			
F.....do		4,046	5.25	21,222.42			
G.....do		47	4.09	192.13			
Total Mesaba.....do		570,009	4.84	2,761,398.83			
H.....do		60,695	5.22	316,630.29			
I.....do		75,460	6.10	460,196.93			
J.....do		405	5.93	2,403.21			
K.....do		12,604	4.60	57,978.40			
L.....do		29,111	4.44	129,170.44			
M.....do		2,052	3.15	6,455.13			
N.....do		4,157	5.45	22,659.62			
Total all other.....do		184,484	5.40	995,494.02			
Total ore		754,493	4.98	3,756,892.85	4,064	181.43	$9.034
Spittings		3,399	.50	1,699.50			
Scale		10,009	1.76	17,628.17			
Total cinder and scale		13,408	1.44	19,327.67	72	3.22	.046
Total ore, cinder, and scale		767,901	4.92	3,776,220.52	4,136	184.65	9.080
Light ladle scrap		4,552	11.56	52,612.66			
Runner scrap		762	12.27	9,347.82			
Pig machine scrap		2,940	12.27	36,076.95			
Off-grade iron		384	15.19	5,831.05			
Total scrap used		8,638	12.02	103,868.48	47	2.08	.250
Gross total metallic mixture		776,539	5.00	3,880,089.00	4,183	186.73	9.330
Light iron ladle skulls and scrap		4,629	11.51	53,275.49			
Heavy chilled ladle skulls and salamanders							
Blast furnace runner scrap		762	12.27	9,349.86			

——— COMPANY. ——— FURNACE PLANT. COST OF PRODUCING BESSEMER PIG IRON AT ALL FURNACES DURING YEAR 191—.—Continued.

Items.	Per cent metallic contents.	Gross tons.	Price.	Amount.	Material per ton.		Cost per ton.
					Pounds.	Per cent.	
Casting machine scrap		2,940	$12.27	$36,087.17			
Off-grade iron		384	14.59	5,602.25			
Slag sales				43.20			
Less total scrap produced		8,715	11.97	104,357.97	47	2.10	$0.251
Net total metallic mixture		767,824	4.92	3,775,731.03	4,136	184.63	9.079
Coke:							
Connellsville—							
Upper........per cent							
Lower........do							
Pocahontas........do							
By-product........do							
Total coke..100 per cent		421,843	3.75	1,580,650.24	2,272	101.44	3.801
Limestone		186,526	1.00	186,542.64	1,005	44.85	.448
Total materials charged		1,376,193	4.03	5,542,923.91	7,413	330.92	13.328
Fuel for miscellaneous purposes:							
Coal........gross tons		37	1.25	46.43			
Coke........do		30	3.74	112.20			.001
Coke dust........do							
Wood........cords		78	3.10	242.03			.001
Natural gas........cubic feet							
Total fuel for miscellaneous purposes				400.66			.002
Labor:							
Superintendents, foremen, clerks, and timekeepers				15,721.40			.038
Stocking and charging				62,774.55			.151
Blowing				31,057.25			.075
Casting				66,162.50			.159
All other producing labor				14,896.10			.036
Labor in repairs				41,804.15			.100
Labor in maintenance				10,939.25			.026
Total labor (enter in red ink)				**243,355.20**			**.585**
Material in repairs				37,103.03			.089
Material in maintenance				6,178.17			.015
Tools, lubricants, and miscellaneous supplies				16,039.45			.039
Refractories				7,140.80			.017
Steam (for details see exhibit). {coal coal equivalent}				121,507.94			.292
Purified gas for blowing engines							
Steam and gas transfers (credit)				**100,326.42**			**.241**
Water				9,093.87			.022
Electric light and power				12,432.33			.030
Yard switching				52,696.50			.127
Laboratory expense				6,191.43			.014
Stable expense				1,678.47			.004

—— COMPANY. —— FURNACE PLANT. COST OF PRODUCING BESSEMER PIG IRON AT ALL FURNACES DURING YEAR 191—.—Continued.

Items.	Gross tons.	Price.	Amount.	Material per ton.		Cost per ton.
				Pounds.	Per cent.	
Shop expense			$10,319.47			$0.025
Dry blast plant expense						
General works expense			36,850.18			.089
Relining and renewal fund			74,856.60			.179
Contingent fund			12,476.10			.030
Total cost above materials charged			547,993.78			1.318
Credit for surplus gas to other departments. Credit			78,758.06			.189
Grand total cost			6,012,159.63			14.457

Total tons produced, 415,871. Tons produced since January 1st .... Average cost per ton since January 1st............

Number of days in operation, 996. Cubic feet air blown per minute .... Average temperature of blast............

Average tons per day, 417.5. Cubic feet air per pound of coke .... Average top temperature..........

Per cent iron produced with sulphur above .05% .... Per cent iron produced with silicon above 1.25%................

Average manganese in spiegel..........%. Average manganese in ferro manganese ....%

Production.	Tons.	Per cent.
Hot metal	318,811	76.67
Pig iron—sand		
Pig iron—casting machine	96,918	23.30
" " chilled		
" " castings	142	.03
Total production	415,871	100.0

Theoretical furnace yield............ 56.63%

Actual furnace yield............ 54.17%

Furnace loss....... 2.46%

Per cent Mesaba ore used......... ....%

Flue dust produced..........tons..........pounds per ton of iron.

Flue dust used...............tons..........pounds per ton of iron.

Date furnace blown in........, out...............

Tons made on present lining.

Iron................

....

Total...............

COST SHEET FOR ALL FURNACES.

This cost sheet shows, of course, only the furnace cost, and does not contain any provision for "additional costs" mentioned above. It illustrates the great detail in which such cost statements are made. The cost sheets for other products, such as rails, show the items of cost with equal minuteness.

As already stated (p. 6), the average costs for the five-year period 1902 to 1906 are to be summarized, first, according to the results shown in the cost sheets and accounts of the several companies, with the addition of general items ("additional cost") shown in the profit and loss accounts (p. 10), but without any elimination of intermediate or intercompany profits arising at some prior stage of production. After considering these costs and some of the facts concerning intermediate profits, certain other statements of cost are presented in Chapter V showing the effect of the elimination of intermediate profits.

arising from the sale or transfer of materials from one stage of production to another within the same concern (but not the profit from transportation of the materials used in manufacture). For this form of statement the average costs are also distinguished as between large companies and smaller companies.

The average total book cost—i. e., the cost including all additional costs for general expense and depreciation and not excluding the intermediate profits on transfer or transportation of materials—will now be summarized for the period 1902 to 1906.

For the chief raw materials, namely, ore and coke, and pig iron, the varying character of the items of cost make it necessary to state the costs separately, but the rolled steel products may be conveniently combined in a single table.

Section 2. Book cost of ore.

LAKE ORE.—The cost of ore is generally the prime cost in iron and steel manufacture. Taking the steel industry alone, during the period in question the great bulk of the ore used was that of the Lake Superior region. The only other important domestic source of ore supply was the South; but almost all this ore was used, from 1902 to 1906, in the production of foundry iron, for cast-iron products.

The Lake Superior ore is mined in several ranges in Minnesota, Michigan, and Wisconsin, two important ranges, namely, the Mesabi and the Vermilion, being located in Minnesota, and three ranges, namely, the Gogebic, Marquette, and Menominee, being located in the northern peninsula of Michigan, two of them lapping over into Wisconsin. The methods of ore mining are in general similar to those for mining other minerals. It is important to note, however, that a good deal of the ore on the Mesabi range is mined from open pits. The costs of production at the mine differ considerably, on the average, between the Mesabi Range on the one hand and the other ranges (which are known as the Old Ranges, because they were the first in which mining was developed), and it is important to note these differences by ranges. Moreover, as the ore is sold not at the mine but at lower Lake ports (e. g., Cleveland, Chicago, etc.), and as there are important differences between the several ranges in the cost of transportation to the lower Lake ports, it is desirable to distinguish their costs at lower Lake ports also. This transportation cost is comprised of (1) rail transportation from the mines to upper Lake ports and (2) vessel transportation from upper to lower Lake ports. Both of these differ to some extent for the several ranges.

The table following shows the average book cost of Lake ore at lower Lake ports, by ranges, for the five-year period 1902 to 1906:

TABLE 2.—AVERAGE BOOK COST PER GROSS TON OF LAKE SUPERIOR ORE AT LOWER LAKE PORTS, AS SHOWN BY THE ORE COMPANIES' ACCOUNTS (INCLUDING INTERMEDIATE PROFITS), BY RANGES, 1902-1906.

Items of cost.	Marquette Range.	Menominee Range.	Gogebic Range.	Vermilion Range.	Mesabi Range.	Total and average.
Tons mined	12,616,253	11,358,357	11,548,988	6,260,574	64,484,556	106,268.728
Labor	$0.79	$0.78	$0.78	$0.50	$0.26	$0.45
Other mining	.57	.58	.53	.44	.26	.37
Royalty	.10	.24	.39	.33	.26	.25
Cost at mine	1.46	1.60	1.70	1.27	.78	1.07
Rail freight	.30	.40	.40	.99	.80	.67
Lake freight	.68	.59	.77	.77	.77	.74
Cost lower Lake ports	2.44	2.59	2.87	3.03	2.35	2.48
General charges	.18	.34	.22	.17	.10	.16
Total book cost	2.62	2.93	3.09	3.20	2.45	2.64

The average book cost of Lake ore at lower Lake ports during the five years 1902 to 1906 was $2.64 per ton. There were considerable differences in book cost for the several ranges.

The average cost at mine, including royalty, was $1.07 per ton, and ranged from $0.78 for the Mesabi to $1.70 for the Gogebic. The average cost at mine for the Old Ranges (i. e., all except the Mesabi) was $1.54 per ton, the average royalty being $0.25 per ton, or almost the same as for the Mesabi, which was $0.26.

The Mesabi range enjoyed, therefore, a large advantage in respect to cost at mine, but its transportation costs were higher than any of the Old Ranges except the Vermilion. The prevailing rail rate for the Mesabi was $0.80 per ton, for Vermilion it averaged nearly $1 per ton, and for the other Old Ranges rates varied from $0.40 to $0.30 per ton. The average Lake rate was the same for the Mesabi, Vermilion, and Gogebic, namely, $0.77 per ton, but somewhat lower for the other two ranges, namely, $0.68 for the Marquette and $0.59 for the Menominee.

Taking the cost at lower Lake ports, that of the Mesabi was $2.35 per ton as against $2.70 for the Old Ranges combined; adding the general charges, that of the Mesabi was $2.45 and that for the Old Ranges combined $2.93.

The total average book cost for all ranges, as stated above, was $2.64. This average represents the cost of about 73 per cent of the total tonnage produced during 1902 to 1906 in the Lake Superior district. It includes large profits to railroads and substantial profits to ore fleets in the charges for rail and lake transportation, which accrued in large part to the steel-making interests consuming the ore. Thus, the rail rates charged on a large part of the Mesabi and Vermilion ore yielded a large profit to the Steel Corporation, while several producing companies operated ore vessels and made large profits on the ore carried.

Southern ore.—By far the most important other ore-mining district was the South, although even this was of little significance in comparison with the Lake Superior district. The average cost of Southern ores is very low; but this ore is very much inferior in grade to Lake ore, containing a much smaller proportion of iron, and none of it being of Bessemer quality. The costs of Southern ore were not as carefully kept as for Lake ore, but charges for depreciation and royalty were naturally lower on account of its inferior quality. As the ores are sold and used in the district where they are produced, thus differing from the Lake ore, no charges for transportation appear in the cost statements. The average mine cost of 12,164,584 tons of Southern ore in the five years 1902 to 1906 was $0.73 per ton, as follows:

Labor	$0.52
Other mining expenses	.16
Depreciation and royalty	.05
Total mine cost	.73

As most of the Southern mines are owned instead of being leased, the item of royalty is partly represented by the allowance for depreciation. The average mine cost of Southern ore was $0.05 lower than the Mesabi, chiefly on account of the low depreciation and royalty on Southern ore due largely to its inferior quality. Eliminating charges for depreciation and royalty, the remaining mine cost of Mesabi ore was considerably lower. The average mine cost of all Lake ore on the same basis, however, was much higher than for Southern ore.

The costs at the furnace for Southern ore, however, include very small transportation charges, a decidedly important factor in the lower total cost figures for such ore.

For some iron and steel making concerns on the lower Lakes (as, for example, those located at Cleveland, Buffalo, or Chicago) the cost of ore at lower Lake ports practically covers the total cost delivered at the furnace. For other producing districts (such as Pittsburgh or the Shenango and Mahoning Valleys) a rail freight charge must be added to the cost at lower Lake ports to give the total cost at the furnace.

Profits on transfers.—The cost of ore at lower Lake ports is important, because it is the usual point of sale. Even those concerns which produce and transport their own ore compute cost at furnace on the basis of the market prices at lower Lake ports, adding freight charges to such market prices instead of to the actual cost at lower Lake ports.

There is, as a matter of fact, a very large margin of profit between cost and market price of ore at lower Lake ports. This ore profit has a very important bearing on the whole industry. For the five years 1902 to 1906 the profit and loss accounts of these ore-producing interests show that the sales and transfers of over 109,000,000 tons of Lake ore yielded an average profit of $0.66 per ton. On transfers alone (these excluding sales to outside parties) the average profit was no less than $0.75 per ton. The taking of these intermediate profits thus greatly increased the book cost of the ore in the pig iron for those companies which produced their ore (p. 48).

As these profit and loss statements respecting the price and cost of Lake ore are of importance in the subsequent discussion of the net cost of ore, the average costs shown by these statements for the five years 1902 to 1906 should be noted here, namely, $2.67 per ton at lower Lake ports. This is practically the same as the production cost, computed from the cost sheets, at lower Lake ports noted above, namely, $2.64 per ton. The difference in cost of $0.03 per ton was chiefly due to comparatively slight differences between the tonnages of production (shown in the cost sheets) and the tonnages sold (shown in the profit and loss sheets).

Section 3. Book cost of coke.

The principal blast furnace coke production of the United States is found in the Connellsville region, in Pennsylvania. The product of this district, particularly during the period 1902 to 1906, was the one chiefly used in almost all the large iron and steel producing districts except the Southern.

Beehive coke.—In this process the coal is converted into coke in ovens of beehive form and without the recovery of any by-products. The Connellsville coke is all produced in beehive ovens. The Southern district, although second in importance, had a comparatively small production. The only other important district producing beehive coke was the Pocahontas, but there was considerable miscellaneous beehive coke production for which cost data were obtained by the Bureau.

The cost of beehive coke by the chief districts of production for the five-year period 1902 to 1906 is shown in the following table:

Table 3.—AVERAGE BOOK COST PER NET TON OF BEEHIVE COKE, AS SHOWN BY THE PRODUCING COMPANIES' ACCOUNTS, BY DISTRICTS, 1902-1906.

Items of cost.	Connellsville district.	Birmingham district.	Pocahontas district.	Miscellaneous.	Total and average.
Tons produced	53,154,034	7,513,182	4,170,396	4,214,446	69,052,058
Labor	$0.97	$1.73	$1.26	$1.92	$1.13
Other operating	[1].26	[2].59	.27	[3].70	[4].32
Depreciation and royalty	.20	.11	.21	.11	.19
Total	1.43	2.43	1.74	2.73	1.64

[1] Including credits $0.03.

[2] Including freight $0.16.

[3] Including freight $0.03.

[4] Including credits $0.03, and freights $0.02, or net deduction of $0.01.

These costs comprise those for mining the coal as well as for making the coke.

The cost of labor for the Connellsville coke averaged only $0.97 per ton as against $1.26 for the Pocahontas district and $1.73 for the Birmingham district. The other operating costs for the Connellsville coke were low also, but on account of the greater value of this coal the charges for depreciation and royalty (mostly coal extinguishment) were higher than for the Birmingham district.

While the cost of Connellsville coke was the lowest, it must be remembered that a considerable item, and sometimes a very large item, of freight must be added to this cost to get the cost at the blast furnaces where it is used. The same is true of Pocahontas coke. The Southern coke, on the other hand, is produced at or very near the places of consumption. These coke costs include no transfer profits for the coal used in the Connellsville and Pocahontas districts and practically none for the Birmingham district.

BY-PRODUCT COKE.—This process involves the use of much more elaborate ovens than the beehive process, and results in the recovery of valuable by-products such as tar, gas, ammonium sulphate, etc., the values of which are customarily treated as credits to the cost of the coke. The Bureau had returns for the production of 3,911,349 tons of by-product coke. This was generally made at the iron and steel works, and involved, in addition to the cost of coal at the mine, a large item of freight on the coal, including some transfer profits on coal.

The average cost of this by-product coke for the five years 1902 to 1906 was as follows:

TABLE 4.—AVERAGE BOOK COST PER NET TON OF BY-PRODUCT COKE, AS SHOWN BY THE COST ACCOUNTS (INCLUDING INTERMEDIATE PROFITS), 1902-1906.

Items.	Cost.
Tons produced	3,911,349
Coal (at mine)	$1.27
Coal freight	1.25
Labor	.52
Other operating	.57
Depreciation	.10
Gross cost	3.71
Net credit for by-products	.76
Net cost	2.95

While the cost of this coke was high compared with beehive coke, this was largely due to the freight included in the coal used. It was produced at the place of consumption, so that there was no additional freight on the coke.

Profits on transfers.—In most cases coke produced by a given interest was transferred to allied departments of iron and steel production at a large profit, but in some cases at cost. Such charging of transfer profit in the case of companies using their own coke had the effect, as already explained (p. 5), of enhancing the book cost of coke used in such branches of manufacture without any corresponding real increase in expense. For the Connellsville coke used during the five years 1902 to 1906 such transfer profits for the companies whose costs and sales were examined by the Bureau averaged no less than $0.57 per ton on transfers only.

Section 4. Book cost of pig iron.

Kinds of pig iron.—The costs of pig-iron production differ so widely for the different kinds of pig iron and also as between Northern and Southern districts that it is necessary to present them in three different groups. These groups are: (1) Bessemer pig iron, which was used almost entirely for making Bessemer steel, and produced only in the Northern districts; (2) basic pig iron, used for making open-hearth steel, and produced in the Northern districts; and (3) Southern pig iron, used chiefly during 1902 to 1906 for foundry purposes, although also to a slight extent for open-hearth steel production. The first two kinds of pig iron were made from Lake Superior ores and Connellsville coke for the great bulk of the output covered by the cost statements, while the Southern pig iron was made from the local ores and coke of the Birmingham district.

The following table shows the average costs for these three kinds of pig iron in summary form for the five-year period 1902 to 1906. These costs, it must be repeated, are the book costs, with various intermediate profits included in them. The elimination of these profits will be considered later. In order to show clearly the meaning of this cost statement, certain statistical data as to prices, yield, etc., also derived from the cost sheets, are subjoined thereto.

TABLE 5.—AVERAGE BOOK COSTS PER GROSS TON OF SPECIFIED KINDS OF PIG IRON, SHOWING FURNACE COST AS GIVEN IN THE COST SHEETS (INCLUDING INTERMEDIATE PROFITS), TOGETHER WITH "ADDITIONAL COSTS" (DERIVED FROM PROFIT AND LOSS ACCOUNTS), 1902-1906.

Items.	Bessemer iron.	Basic iron.	Southern iron.
Tons produced	51,902,699	9,573,539	5,339,766
Net metallic mixture	$7.30	$7.14	$2.35
Coke	3.89	3.30	4.48
Limestone	.43	.47	.27
Labor	.77	.62	1.23
Other operating	.87	.77	1.19
Furnace cost	13.26	12.30	9.52
Additional cost	.75	.52	.13
Total cost	14.01	12.82	9.65
Price gross metallic mixture [1]	$4.07	$3.73	$0.95
Price net metallic mixture [1]	$3.97	$3.64	$0.95
Per cent yield	54.4	50.9	40.6
Price coke, net ton	$3.37	$2.90	$2.54
Pounds coke	2,311	2,282	3,523

[1] The price of the gross metallic mixture is the price of the ore, scrap, etc., at the furnace, per gross ton; allowing for the tonnage and value of the scrap recovered gives the basis for figuring the price of the net metallic mixture per gross ton, and this figure multiplied by the number of tons required to make a ton of pig iron (indicated by the per cent yield) gives the cost per ton of pig iron.

The discussion following is an explanation of certain items of cost, and also serves to bring out more clearly the causes for the differences in cost for the different kinds of pig iron.

The cost of pig iron depends chiefly on the cost of the raw materials—ore, coke, and limestone—which are put in the blast furnace. The ore is smelted by burning the coke, and the limestone is put in to facilitate the process and particularly to form a liquid slag to carry off the impurities. The other expenses, such as labor, supplies, repairs, maintenance, furnace relining, general expense, and depreciation, form a comparatively small proportion of the total book cost.

BOOK COST OF RAW MATERIALS.—The cost of the net metallic mixture shown in the above statements of cost comprises the total book cost of the ore used, including small proportions of cinder and scrap, less any credit for scrap recovered from the furnace. The ore or metallic mixture used is only partly iron. It therefore takes more than one ton of it to make a ton of pig iron. The net quantities of metallic mixture required for the pig iron represented in the above table averaged 1.84 tons for Bessemer pig iron, 1.96 tons for basic, and 2.46 tons for Southern pig iron, corresponding to "yields" of iron per ton of ore of 54.4 per cent, 50.9 per cent, and 40.6 per cent, respectively.

The prices per ton of the gross metallic mixture (i. e., the actual prices for ore, scrap, cinder, etc., put in the furnace, without the credit for the scrap recovered), as shown below the cost statement, were $4.07 for Bessemer, $3.73 for basic, and $0.95 for Southern pig iron. These prices were, of course, the prices at the furnace, practically for ore, since that formed the great bulk of the metallic mixture, including all freight expenses and antecedent transfer profits on ore.

These great differences in the prices of the gross metallic mixture were chiefly due to differences in the freight charges on ore. For Southern ore there was but little freight, whereas for the ore for the two kinds of Northern pig iron there was not only the freight (both rail and lake) from the Lake mining districts to the lower Lake ports, but also the rail freight from the lower Lake ports (at which point the ore is generally sold or transferred) to the furnaces.

The average rail and lake transportation charge from mines to lower Lake ports for all the ore covered by the Bureau's computations (both Bessemer and non-Bessemer) was $1.41 per ton. (Table 2, p. 16.) If to this be added the average freight charge from lower Lake ports to the furnaces, which averaged $0.67 per ton for the ore used in both Bessemer and basic furnaces, the total transportation charge is $2.08 per ton. In other words, the freight charges on ore for the Northern pig iron were more than twice the price of the Southern ore at the furnace.

The great differences between the ore costs for Northern and Southern pig iron were due to these large freight charges on Northern ore and also largely to the fact (discussed in much detail later) that the Northern ore costs included considerable transfer profits on ore, the ore being transferred to the furnace above the real cost. For Bessemer and basic pig iron combined this transfer profit was about $0.65 per ton of ore used and nearly double that, of course, in the quantity of ore used to make a ton of pig iron.

The Southern ore costs included practically no transfer profit.

The costs of coke in the pig-iron cost statements may be analyzed in a similar way. They differed considerably, owing, first, to the different average prices of coke at the furnace, and, second, to the different quantities required per ton of pig iron. The coke used for both Bessemer and basic iron was chiefly Connellsville coke. The price f. o. b. Connellsville was about $2.01 per net ton in each case. The average freight to the furnace was about $1.36 per net ton for the furnaces making Bessemer iron and about $0.89 per net ton for the basic furnaces, giving furnace prices of $3.37 and $2.90 per net ton, respectively. While the higher cost of the coke per ton of pig iron in the Bessemer furnaces was chiefly due, therefore, to this difference in price at the furnace, it was also due in part to the use of a larger quantity of coke per ton of pig iron, namely, 2,311 pounds in the case of Bessemer as compared with 2,282 pounds per ton in the case of basic pig iron. For both kinds of Northern pig iron the book cost of the coke included large transfer profits.

For Southern pig iron the cost of coke per ton of pig iron was very high, namely, $4.48, not so much because the price of coke at the furnace was high (only $2.54 per ton, with very little freight expense or transfer profit included), but because an exceptionally large quantity was required to melt the low-grade Southern ores, namely, 3,523 pounds per ton of pig iron.

In the cost of limestone per ton of pig iron there was very little difference between the Bessemer and basic pig iron, as both the prices at the furnace and the quantities used were about the same in each case.

Although some of the Southern ores contain considerable lime and some of them consequently are self-fluxing, or almost so (i. e., they do not require the addition of limestone to flux them), yet on the average the Southern pig iron for which cost statements were procured by the Bureau required over 100 pounds more limestone per ton of pig iron than either the Northern Bessemer or basic iron. It should be noted, however, that for the last two years covered by these averages the quantity of limestone required for the Southern furnaces was somewhat lower than for the Northern furnaces. (See p. 109.)

LABOR AND OTHER COSTS ABOVE MATERIALS.—The labor costs for Bessemer pig iron averaged somewhat higher than for basic; this was probably due to a greater average size and efficiency of equipment for the basic furnaces. The labor costs for Southern pig iron were very much greater than for either Bessemer or basic pig iron. The chief reason for this probably was that the Southern furnaces, on account of the low grade of the ore, required the using of a much greater quantity of materials in the furnace per ton of product. Thus, for the production shown in the above table, the average quantity of ore, coke, and limestone per ton of pig iron in the Bessemer and basic furnaces combined was 3.36 tons as against 4.53 tons for the Southern furnaces, or 34.8 per cent more for the latter. Other factors accounting for the high labor cost of Southern pig iron were smaller and less efficient furnaces and the lower efficiency of labor itself.

Practically the same circumstances explain the fact that the other operating costs were higher for Southern than for Northern pig iron.

FURNACE COSTS AND TOTAL BOOK COSTS.—The table shows that the furnace cost of Bessemer pig iron was $13.26 per ton, as compared with $12.30 for basic, this difference being chiefly due to the lower price of ore and lower freights on ore and coke combined for the basic furnaces.

For Southern pig iron the furnace cost was $9.52, which was much lower than for either Bessemer or basic. The chief reasons for the higher furnace cost of Northern pig iron were (1) the large freight charges involved in assembling the raw materials at the Northern furnaces and (2) the large profits on ore and coke included in the costs of those materials for the Northern furnaces. The transfer profits on ore and coke used in making Southern pig iron were very small.

The items of "additional cost" derived from the profit and loss accounts can not be allocated except by more or less arbitrary methods of apportionment. (See p. 11.) They comprise the items of general expense and depreciation. It is probable that the Bureau has erred on the side of making the costs too high in including the full amount of these additional charges in the case of Bessemer and basic pig iron, inasmuch as the charges for general expense are incurred only in a small degree in connection with the pig-iron branch of the business for large steel companies, though the system of allocating these additional expenses gave an item of general expense of $0.36 per ton for Bessemer pig iron and $0.27 for basic pig iron. A fair average depreciation for a blast-furnace plant is $0.40 per ton of product. The allocation of "additional costs" for this item, on the principle applied, worked out to give an average depreciation charge of $0.39 for Bessemer pig iron, but of only $0.25 per ton for basic. For basic iron, therefore, the allowance for depreciation was probably too low. Taking the total additional cost, the allowance per ton is considerably too high for Bessemer and a little too high for basic. For Southern pig iron, on the other hand, it was evidently too low. These additional expenses are, therefore, stated in full as separate items, with the caution that they are undoubtedly sometimes excessive and sometimes inadequate.

The furnace cost plus the additional expenses gives the total book cost already described (p. 11). This book cost, it should be remembered, is computed without any reduction for the large intermediate profits included in the costs of the raw materials; that is to say, the ore and coke going into the pig-iron cost statement, at least for a large part of the tonnage shown, has been charged at a transfer price considerably higher than the real cost of the raw material to the concerns whose costs are shown.

It is evident that since the book costs of pig iron are thereby increased, the book cost of making steel (for which pig iron is the chief raw material) is necessarily increased also, even though no profits were charged when pig iron was sold or transferred to the steel works. As a matter of fact, however, such profits are sometimes charged.

The allocation of the "additional cost" items to the costs of pig iron still further increases the advantage of the Southern pig iron over the Northern in respect to costs, giving for the total book costs per ton $14.01 for Bessemer, $12.82 for basic, and $9.65 for Southern. As stated above, however, while these allowances for Northern furnaces were too high, those for Southern furnaces were too low. Therefore, if these allowances were all figured on a uniform basis, these additional costs for the two districts would be more nearly equal. If an additional cost of $0.50 per ton, for both general expense and general depreciation combined, be assumed, and it is undoubtedly enough for most iron and steel companies, the total costs would be as follows: Bessemer, $13.76; basic, $12.80; and Southern, $10.02 per ton.

Judging from the book cost of production simply, the Southern pig iron shows a distinct advantage over Northern basic pig iron, with which it should be compared (and not with Bessemer). As will be shown later (see p. 109), this holds true even after the elimination of intermediate profits. But it must be considered that this is counterbalanced by the much higher freight charges necessary to get the Southern pig iron to the most important markets of consumption.

PROFITS ON PIG IRON SOLD AND USED.—Only a small proportion of the total quantity of Northern pig iron produced was sold or transferred at a profit. The technique of the industry has bound so closely together the blast-furnace plants making pig iron for steel production with the steel works, that the two departments of the business in most large companies are conducted on the basis of transferring the pig iron from the blast furnaces to the steel works at furnace cost, without profit. Where a concern controls several companies, however, it may transfer some of its pig iron from one company to another at a profit over the furnace cost. During the period 1902 to 1906 the records of profit and loss on Northern pig iron transferred at a profit showed transfers of 12,223,498 tons at an average price of $14.38 per ton and an average profit (for this step alone) of $0.55 per ton. There were also sales of such pig iron amounting to 3,188,377 tons, on which the average profit was $2.05 per ton. Most of the Northern pig iron, however, was transferred to steel works without any profit, so that the average profit on the total quantity sold and used was a much smaller amount per ton.

The situation was somewhat different with respect to Southern pig iron. Most of it was used for foundry purposes, and was largely sold to Northern consumers of pig iron at market prices. A part of it was used by the same concerns which produced it either for making iron castings or for conversion into steel. The total quantity of Southern pig iron transferred at a profit (which comprised practically all which was not sold) for the five years 1902 to 1906 was 1,107,837 tons, and the average transfer price was $11.32 per ton, showing an average transfer profit of $1.62 per ton. These transfer profits tended of course to enhance the book cost of the pig iron in iron castings or steel made by the same concerns which produced the pig iron.

Section 5. Book cost of steel ingots.

The conversion of pig iron into steel forms a very distinct and very important stage in the manufacture of steel products. This conversion involves a change in composition, or chemical change. It is accomplished usually, for ordinary commercial grades of steel, either in the Bessemer converter (Bessemer steel) or in open-hearth furnaces, which are distinguished as being either *acid* or *basic*, according as they use pig iron and scrap which are low in phosphorus (Bessemer iron) or pig iron and scrap which are high in phosphorus (basic iron). The steel is also distinguished, with respect to the products to be made from it, into rail ingots and billet ingots, although this has very little effect on the character of the process. During the period here under consideration this distinction has little importance except for Bessemer steel, as very little open-hearth steel was then used in making rails. The production of acid open-hearth steel is more expensive than basic open-hearth steel and is largely for special qualities, and it is not important to present the results herein. The production of basic open-hearth steel, which by 1908 exceeded Bessemer steel, was considerably less during the period here under consideration.

The following table shows the average book costs for the production of Bessemer rail ingots and Bessemer billet ingots and of basic open-hearth ingots for all districts for the five-year period 1902 to 1906, inclusive.

Subjoined to the cost statement are certain statistical data respecting the prices and quantities of materials used, etc., which are also derived from the cost sheets and are of importance in analyzing the results and in facilitating a comparison between the cost of the pig iron used, per ton, and the average costs of pig iron previously shown.

TABLE 6.—AVERAGE BOOK COST PER GROSS TON OF SPECIFIED KINDS OF STEEL INGOTS, SHOWING WORKS COST AS GIVEN IN THE COST SHEETS (INCLUDING INTERMEDIATE PROFITS), TOGETHER WITH ADDITIONAL COSTS (DERIVED FROM THE PROFIT AND LOSS ACCOUNTS), 1902-1906.

Items.	Bessemer rail ingots.	Bessemer billet ingots.	Basic open-hearth ingots.
Tons produced	19,486,978	29,099,783	24,731,706
Pig iron and scrap	$14.84	$14.88	$14.13
Manganese	.82	.31	.34
Labor	.61	.57	.92
Fuel	.18	.24	.70
Other operating	.70	.64	1.10
Rebuilding fund			.22
Works cost	17.15	16.64	17.41
Additional cost	1.05	.92	.79
Total cost	18.20	17.56	18.20
Price of pig iron and scrap used	$13.69	$13.59	$13.18
Pounds of pig iron and scrap used	2,451	2,490	2,480
Price of scrap recovered	$6.92	$7.94	$9.29
Pounds of scrap recovered	45	65	110
Net cost of waste	$1.15	$1.29	$0.95

It should be stated at the outset that a comparison of these cost averages for the purpose of determining the relative economy or advantages of the Bessemer as compared with the open-hearth process would be somewhat misleading. A more satisfactory comparison for this purpose would be found in taking a single district producing large tonnages of both sorts of steel for a particular year.

COST OF IRON AND MANGANESE.—The Bessemer process uses pig iron almost entirely (with very little scrap), and in molten form usually direct from the blast furnace, but to some extent (particularly for the Sunday production of pig iron, during which day the steel works are not operating) cold pig iron and scrap remelted in cupola furnaces. The prices at which this metal was charged into the ingot cost were usually the furnace costs at the blast furnace, which was invariably connected with the steel works for the plants whose costs are here shown. This cost of the iron (pig iron and scrap exclusive of manganese and similar additions) used per ton of product depended also on the quantity of the gross loss, the price of the metal thus lost, and the quantity and value of the scrap recovered. In other words, the net waste per ton of product which is shown below the cost statement, if added to the price per ton of the material used, gives the cost of the net pig iron and scrap. In order to show more clearly the difference between rail and billet ingots, the cost of manganese (including similar additions of a metallic character) has not been included in the pig iron and scrap in this cost statement, but is shown separately.

The costs of the pig iron and scrap for Bessemer rail ingots and Bessemer billet ingots for the production covered by the above statement were nearly the same, namely, $14.84 and $14.88, respectively.

In the open-hearth process the proportion of scrap used is very large, and for the production of the basic steel here under consideration constituted about one-half of the total pig iron and scrap. Other things being equal, the price of this pig iron and scrap tends to be lower than for the Bessemer process, not only on account of the greater proportion of low-priced scrap, but also because basic iron is used instead of Bessemer. The cost of the waste also tends to be lower because the price of the material lost tends to be lower, while the price of the scrap recovered tends to be higher, being very low in phosphorus. Hence, the cost of the pig iron and scrap for the basic open-hearth ingots was considerably lower than for the Bessemer ingots, namely, $14.13 per ton.

The average quantity of manganese which is put into the molten steel is especially large for rail ingots in order to harden them, and the cost was relatively high at $0.82 per ton, but was much less for Bessemer billet and open-hearth ingots, namely, $0.31 and $0.34, respectively.

LABOR AND OTHER COSTS ABOVE MATERIALS.—For nearly all these expenses the open-hearth process is at a distinct disadvantage compared with the Bessemer. This is due partly to the more elaborate plant and equipment necessary compared with the tonnage produced, and also to special depreciation charges which are necessary for the rebuilding of open-hearth furnaces. Thus, the item of labor per ton was more than 50 per cent higher for the basic open-hearth process. The item of fuel was also much higher; this expense is largely for natural gas or coal to make producer gas for open-hearth furnaces, and for cupola coke at Bessemer plants. The disproportion in other operating expenses was even greater. This results largely from much heavier expenses per ton for limestone (used in the open-hearth furnace), for materials and supplies, etc. The cost of steam power is the only important expense of this kind in which the Bessemer process was at a disadvantage compared with the open hearth.

Thus the cost above materials (i. e., works or mill cost exclusive of cost of pig iron and scrap and manganese) was much higher for the basic open-hearth process, being $2.94 per ton as against $1.49 per ton for Bessemer rail ingots and $1.45 per ton for Bessemer billet ingots.

WORKS COSTS AND TOTAL BOOK COSTS.—This higher cost above materials for basic open-hearth ingots more than offsets the lower cost of the pig iron and scrap used and resulted in a total works cost of $17.41 per ton as against $17.15 per ton for Bessemer rail ingots and $16.64 per ton for Bessemer billet ingots.

Although, as already stated, the particular average costs of ingots here compared may not be the most representative, it is evident that the works cost of open-hearth steel, in spite of the cheaper priced metal used, is generally higher than Bessemer steel. In the foregoing figures the pig iron is usually taken over at book cost. This higher cost above materials explains in part the lower price of basic iron, and, through the lower price of basic iron, the lower price of non-Bessemer ores.

The "additional costs," which have been explained above (p. 10), happened to be higher for the Bessemer ingots than for the basic open hearth. These additional costs appear very high, largely on account of their cumulative character (p. 10); that is, the pig iron being transferred to the steel works generally at furnace cost without regard to the items of additional expense, the additional costs for pig iron not being carried forward in the price thereof are practically repeated in the additional costs for ingots along with such part of these additional costs as is attributed to the process of converting the pig iron into steel.

The total book cost of ingots (i. e., the works costs plus the additional costs) was $18.20 for Bessemer rail ingots, $17.56 for Bessemer billet ingots, and $18.20 for basic open-hearth ingots. These additional costs have just been criticised above. Instead of the figures used in the table, an estimated figure for general expense and general depreciation may be given as in the case of pig iron. Allowing, of course, for the cumulative principle just described, it is estimated that $0.60 per ton would be sufficient for the Bessemer plants and $0.85 for the open-hearth plants. Adding these to the works costs already stated, the total costs of these ingots would be as follows: Bessemer rail ingots, $17.75; Bessemer billet ingots, $17.24; and open-hearth ingots, $18.26 per ton.

These costs are book costs; that is, they include, of course, all such intermediate transfer profits on ore, coke, and pig iron as may have been charged into the prices of the materials used either in preceding stages of manufacture or in the conversion of pig iron into steel, as well as transportation profits for certain companies. As shown above (p. 25), transfer profits were seldom charged on pig iron, and these when spread over the entire tonnage used in making steel averaged only a small amount per ton.

Section 6. Book costs of rolled products.

The rolling of ingots into various forms, such as billets, rails, bars, tubes, sheets, and wire rods, which constitutes a change of form in the steel, is a third stage in manufacture. In general this report does not extend beyond the rolled products. There are, however, two important exceptions, namely, drawn wire and tin and terne plate. In addition to drawn wire, there are numerous other more elaborated wire products, such, for instance, as nails, but these are not included in the Bureau's cost averages. Similarly, black sheets are often coated in other ways than by tinning, as, for instance, by galvanizing with zinc, but galvanized and other sheet products are not discussed in this report.

The following table shows the average book costs of these products for the five-year period 1902 to 1906:

TABLE 7.—AVERAGE BOOK COSTS PER GROSS TON [1] OF SPECIFIED PRODUCTS, SHOWING MILL COSTS AS GIVEN IN COST SHEETS (WITHOUT DEDUCTION OF INTERMEDIATE PROFITS), TOGETHER WITH ADDITIONAL COSTS (DERIVED FROM THE PROFIT AND LOSS ACCOUNTS), 1902–1906.

Products.	Tons produced.	Cost.						
		Raw material.	Cost above materials.			Mill cost.	Additional cost.	Total cost.
			Labor.	Other operating.	Total.			
Bessemer heavy rails (from ingots)	14,020,303	$18.29	$1.25	$1.43	$2.68	$20.97	$1.26	$22.23
Large Bessemer billets (from ingots)	17,908,033	17.72	.55	.82	1.37	19.09	1.09	20.18
Large basic open-hearth billets (from ingots)	13,422,740	18.45	.55	.97	1.52	19.97	.90	20.87
Small Bessemer billets (from ingots)	2,686,706	16.88	.66	1.16	1.82	18.70	.98	19.68
Bessemer sheet bars (from ingots)	4,808,673	16.45	.57	1.12	1.69	18.14	.84	18.98
Sheared plates (from slabs)	3,317,232	21.55	2.36	2.19	4.55	26.10	1.39	27.49
Universal plates (from ingots)	1,032,388	17.70	1.24	1.89	3.13	20.83	.99	21.82
Universal plates (from slabs)	2,007,344	21.78	1.83	1.94	3.77	25.55	.85	26.40
Structural (from ingots)	1,724,641	20.21	2.15	2.74	4.89	25.10	1.42	26.52
Structural (from billets)	2,693,231	21.88	2.54	2.11	4.65	26.53	1.23	27.76
Merchant bars (from large billets)	4,379,780	21.41	3.06	2.28	5.34	26.75	1.37	28.12
Wire rods (from billets)	6,867,310	21.42	1.53	2.28	3.81	25.23	1.98	27.21
Bright coarse wire (from rods)	6,510,368	23.50	1.62	1.87	3.49	26.99	2.13	29.12
Black sheets (from sheet bars)	2,418,214	22.99	10.39	4.12	14.51	37.50	1.87	39.37
Black plate (from sheet bars)	2,091,615	25.25	14.19	7.41	21.60	46.85	2.14	48.99
Tin and terne plate (from black plate)	38,404,002	[2] 2.67	.19	.18	.37	3.04	.14	3.18

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[1] Except for bright coarse wire and black sheets, which are for net tons, and for tin and terne plate, which are for base boxes of 100 pounds.

[2] Includes $2.04 for black plate and $0.63 for tin.

The above table shows the product,[1] the tons produced, the costs per ton of product distinguished with respect to the raw material, the labor, and the other operating expense, and the cost of the last two items (cost above materials) combined; and the cost of raw material and cost above materials, together constituting the mill cost. There are then added the "additional costs" (which the Bureau derived from the profit and loss statements of the companies), which include chiefly general expense and general depreciation not specifically allotted to the various products, or even included in the several companies' statements of manufacturing and producing cost, but which were nevertheless expenses of the business and allowances actually made for depreciation. These allowances were undoubtedly sometimes too high for the average of the total production, but a readjustment of these allowances for each product would have been practically impossible. It should also be borne in mind, as explained already (p. 29), that in consequence of the fact that each product, from the pig iron on, is generally charged into the next step at mill cost instead of the total book cost here shown—that is, without taking account of these additional expenses—the result is that these items naturally increase in a cumulative manner. Thus they tend to be higher per ton for ingots than for pig iron, for the heavy-rolled products than for ingots, and for light-rolled products than for heavy-rolled products. There were, however, great differences in these additional expenses for different companies, and the different companies did not have the same proportions of the total output for each product, and often for some products no output at all.

Furthermore, it is probable that the additional costs for the lighter rolled products are in most cases too low, on account of the methods used in allocating them. As appears from the foregoing discussion, they were too high, on the average, for pig iron and ingots, but probably about right for rails. If the total amount is assumed to be right for general expenses and not greatly excessive for depreciation, it follows that in so far as the additional costs for the earlier stages of production are cut down, they must be increased at the later stages. This view is apparently correct for the depreciation, and undoubtedly correct for general expenses. The latter are very largely incurred in connection with the sale of finished products, and more particularly such products as structural materials, merchant bar, wire products, sheets, tin plate, and tubes. Steel makers rarely sell pig iron, and generally only a small portion of their billets and other semifinished steel. Billets do not require much expense to sell, and rails probably even less.

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[1] The Bureau obtained and compiled data with regard to the costs of certain other rolled products, such as billets from acid open-hearth ingots, sheet bars from open-hearth steel, light rails, girder rails, hoops and bands, cotton ties, merchant bar from small billets, muck bar and tubes, most of which will be covered in detail in the full report. In some cases, however, the tonnage reported was too small for the results to be significant, while in some other cases the product itsel included too great a range of sizes to make the average of much value.

It should be noted in connection with costs for particular rolled products that there are often considerable differences between the average costs of products which do not seem to be proportional to the normal differences of costs of production. It is important to bear in mind, therefore, that for different plants there were marked differences in the cost of the same product, and further that in most cases the group of plants whose costs are averaged for one product is not the same as the group for another product. Thus billets were made by a great number of plants, but sheet bars by a comparatively small number, and the latter, moreover, included some of the most efficient plants in the country. This explains why the average cost of Bessemer sheet bars was lower than the average cost of large Bessemer billets, although sheet bars produced at any given plant would cost more than such billets.

It would involve a tedious discussion to consider the circumstances governing the costs of each of these rolled products. It will be sufficient to consider briefly a few of the most important ones, and to mention some of the characteristic conditions and conspicuous differences affecting book costs. In particular it is interesting to note the proportion that the labor cost bears to the total mill cost. For this purpose it is not possible here to take account of any labor costs except those which are directly entered as such in the cost sheets, but it should be clearly understood that the pay roll would, if completely analyzed and allocated, show a distinctly larger proportion.

Book cost of billets.—These are the simplest of the products rolled from ingots, and consist in typical form of lengths of steel 4 by 4 inches square. As they are only semifinished and must be rolled further to have a merchantable character (that is, to be purchased by other manufacturers than those operating rolling mills), it is not necessary during the process of rolling to cut or "crop" the defective ends so closely as for some products. The labor cost is very low compared with the cost of the ingots from which the billets are rolled. For the above noted production of large Bessemer billets, the labor cost, which was only $0.55 per ton, formed 2.9 per cent of the mill cost, while the total cost above materials, namely, $1.37, was only 7.2 per cent of the mill cost. The mill cost of large Bessemer billets was $19.09 per ton, and the total book cost—that is, including profit and loss items of general expense and depreciation—was $20.18 per ton.

Book cost of rails.—The cost of rails, made from rail ingots, is also chiefly a question of the cost of the raw material. The labor cost for the above-noted production was $1.25 per ton, which formed only 6 per cent of the mill cost, and the total cost above materials was $2.68 per ton, or only 12.8 per cent of the mill cost. Rails, moreover, are not a particularly simple product, because they must be made with great care, and the ends must be cropped off during the process of rolling to a greater extent than for billets. Furthermore, they require considerable labor for straightening and finishing after they are cold.

The total mill cost was $20.97 per ton, and this with the additional costs made the total book cost $22.23 per ton.

Book cost of plates.—It is interesting to compare the costs of sheared plates from slabs with universal plates from slabs. Slabs are a semifinished product like billets. Sheared plates are rolled from the slabs and then the rough edges are sheared off to give them uniform gauge and the required form. Universal plates are rolled directly both to uniform gauge and required form. The former process involves more labor than the latter, which is largely automatic. This result is shown in the item of labor cost, which was $2.36 per ton for sheared plates from slabs and $1.83 per ton for universal plates from slabs; a substantially proportional difference appears for the total costs above materials. Consequently, although it happened that the slabs cost a little less for sheared plates than for universal plates, the mill cost was lower for the latter.

That the universal plates from ingots had a lower cost above materials than universal plates from slabs, in spite of the fact that the former included two stages of rolling as compared with one for the latter, was due chiefly to the fact that they comprised plates of greater average thickness of gauge, enabling the production of a much larger tonnage during a given period of time, thus making the labor cost per ton and all other items of cost above materials much lower.

Book cost of merchant bars.—This product includes a variety of shapes, such as rounds, squares, flats, etc., and a very great variety of dimensions. It is the chief article of steel required in the manufacture of machines, implements, and tools, besides a great many other kinds of ordinary hardware. The merchant bars shown in the above table were rolled from large billets, which shows that the bars produced were chiefly of the heavier shapes. Owing to the great variety of forms and sizes of steel bars and the comparatively small tonnages at most mills for a given size, the labor cost tends to be higher than for many products which otherwise would involve quite as much labor per unit. For the same reasons the other items of cost above materials tend to be high. The total cost above materials for the steel bars shown in the foregoing table was $5.34 per ton, and constituted 20 per cent of the mill cost, which was $26.75 per ton. The average book cost was $28.12 per ton.

Book cost of wire rods.—This product, like hoops, is rolled out to such small dimensions that it is coiled up as it emerges from the mill. The most modern mills are largely automatic, a billet being started at the beginning and running through a succession of rolls with rapidly accelerating speed as it decreases in diameter. Although the gauges of drawn wire are very numerous, the gauges of wire rods are few in comparison, and an immense tonnage is rolled for the standard sizes of such widely used articles as fence wire and wire nails. The cost above materials for wire rods is chiefly on this account much lower than for merchant bar, averaging $3.81 per ton for the quantity covered in the foregoing table, or 15.1 per cent of the mill cost, namely, $25.23 per ton. The total book cost was $27.21 per ton.

Book cost of black sheets.—This product differs markedly from most of those previously discussed, particularly with respect to the large labor cost involved in its manufacture. The modern rolling mills for the products heretofore considered (except certain kinds of light bars and wire rods not made at the automatic or continuous mills) are generally so constructed that the material is lifted and placed between the rolls and moved either continuously forward, or back and forth, under them with the intervention of a comparatively small amount of manual labor. For sheets and allied products, however, invention has not succeeded to the same degree in substituting automatic devices. In making sheets the sheet bars are passed through the rolls and worked back and forth by laborers who stand at either side, and who are also required to double the material several times as it is reduced in thickness and expands in area. This process is also interrupted for the reheating of the partially rolled material. The number of passes through the rolls depends partly on the original thickness of the sheet bar and partly on the gauge to which the sheets are to be rolled. The sheet rollers form a class of specially skilled labor.

The cost of labor in the manufacture of black sheets constitutes, therefore, a considerable element in the mill cost. For the tonnage represented in the foregoing table the labor cost was $10.39 per net ton, or 27.7 per cent of the mill cost; the total cost above materials was $14.51 per net ton, or 38.7 per cent of mill cost. The mill cost was $37.50 per net ton, and total book cost $39.37 per net ton.

Book cost of black plate.—This commodity is similar to black sheets, but is subject to further treatment to make it suitable for tinning. The additional processes are pickling, annealing, and cold rolling. Pickling consists in putting the black sheets through an acid bath to remove impurities from the surface; annealing, in heating and cooling the metal slowly to make it pliable; and cold rolling, in giving it a final rolling to insure perfect smoothness and correctness in gauge. All of these processes involve considerable handling and labor, and also large expenses for materials and supplies.

The labor cost of black plate forms, therefore, a considerable item, and for the production shown in the foregoing table amounted to $14.19 per ton, or 30.3 per cent of the mill cost. The other items of cost above materials were $7.41 per ton, so that the total cost above materials was no less than $21.60 per ton, or 46.1 per cent of the mill cost. The mill cost was $46.85 per ton, and the total book cost $48.99 per ton.

BOOK COST OF TIN AND TERNE PLATE.—This product is sold and the cost is reckoned on the basis of a standard or base box which contains 100 pounds of tin plate. To compare the costs of tin plate with black plate, from which it is made, they should be multiplied by 22.4 to get both on a gross-ton basis. Apart from the black plate used, the most important item of expense is for pig tin. The labor cost in tinning is comparatively small.

For the production shown in the above table the average cost of the black plate was $2.04 per base box, and the pig tin $0.63 per base box. These two items are grouped together in the table for convenience in statement. While the black plate has a cost which, even for the least integrated companies, goes back to the cost of sheet bars and for most of the producing interests goes back to the cost of ore and coke, the pig tin is an imported article purchased in the world market and at prices which show considerable fluctuations.

The labor cost of tin plate for the production under consideration was $0.19 per base box, and formed 6.3 per cent of the mill cost. The total cost above materials was $0.37 per base box, or 12.2 per cent of the mill cost. The mill cost was $3.04 per base box, and the total book cost $3.18 per base box ($71.23 per gross ton).

Section 7. Character and significance of foregoing book cost statements.

The foregoing discussion covers the mill costs as shown on the books of the companies, and also shows the book costs by adding to the former the "additional costs" (general expense and depreciation) shown by the profit and loss statements. These book costs, however, if taken by themselves, form an imperfect basis for judging the cost of production. This is because, as already explained, there are large but very varying items of intermediate profit included in the price of the materials transferred from one stage of production to a succeeding stage.

The next and far more important step will be to show what these book costs become when intermediate transfer profits are eliminated. This further process could be carried out by the Bureau, however, only for ore, pig iron, and crude steel, and a very limited number of rolled products. For the other products shown above, therefore, the total book cost is a figure of distinctly limited value. The principal interest, indeed, of the foregoing cost statements for most of the finished products is found not in the book cost or even in the mill cost, but in the costs above materials, or, in other words, all items of mill cost except the material used. This is a much better standard of comparison than the *conversion cost,* which includes the cost of waste, because the cost of waste must be figured on the prices of the materials used—itself a fluctuating and, as has been shown, unreliable figure, often containing considerable items of antecedent profit. The costs above materials, on the other hand, are of great value and great interest.

CHAPTER IV.

METHODS OF ELIMINATING INTERMEDIATE TRANSFER PROFITS FROM BOOK COSTS.

Section 1. Two kinds of profits included in book costs.

The importance of eliminating intermediate profits included in the foregoing book costs has been repeatedly referred to. These intermediate profits are of two kinds—(1) transfer profits and (2) profits on transportation.

Transfer profits, as already made clear, are profits added by an integrated concern to the cost of an antecedent raw material—such as ore or coke, or a relatively crude material, as, for instance, pig iron, ingots, or billets—in transferring these materials from one subcompany to another or from one department to another.

Transportation profits are the profits from the transportation of ore used in making pig iron and steel. These are the only profits of this kind directly connected with the cost of production of iron and steel which can be determined with any degree of accuracy.

The elimination of these profits would present a somewhat different problem than in the case of transfer profits. Integration of the production of raw materials may be regarded as a normal condition in the steel industry at the present time. On the other hand, the integration of such production with the transportation agencies which serve them is exceptional. Railroads, apart from industrial switching facilities (and as distinguished from vessel fleets), could not, under most conditions of the industry, be provided for each integrated concern, no matter how large, without involving great waste of capital in investment and excessive costs of production. Hence, while the costs arrived at by eliminating transfer profits may be regarded as normal figures for successful modern companies, the elimination of transportation profits would tend rather to show the influence of an exceptional factor in the industry.

For these reasons the Bureau has revised the book costs at this point in one way only, namely, eliminating merely the intermediate transfer profits on materials passing from one stage of production to another. In Chapter VII the costs will be shown for the Steel Corporation alone for the year 1910, eliminating both transfer and transportation profits, as it is for this concern only that the transportation profits are of great significance in the cost of production.

It is desirable first to point out the scope of the cost data from which such profits are eliminated and then certain general rules followed in eliminating transfer profits.

Section 2. Extent of industry covered and distinction of large and small companies.

LIMITATION OF DISCUSSION TO LAKE ORE-USING DISTRICTS.—In making its revision of book cost data the Bureau has confined itself to concerns using almost exclusively Lake ores. At the present time the steel industry is practically based on Lake ores. The districts of production which, considering both volume of output and conditions of cost, most fairly represent the position of the United States as a whole are those which lie west of the Allegheny Mountains, north of the Ohio, and east of the Mississippi Rivers. This region includes such important districts as Pittsburgh, the Valleys, Lake Erie, Wheeling, southern Ohio, and Chicago.

While the limitation of the discussion of the revised costs to these particular districts necessitates the exclusion of considerable of the data presented in preceding book cost statements, nevertheless the cost data comprised in this study of revised costs embrace not only the bulk of those obtained by the Bureau, but also include a very substantial proportion of the total business of the United States for the period in question. This is clearly shown by the following table:

TABLE 8.—PRODUCTION OF SPECIFIED PRODUCTS COMPRISED IN BUREAU'S COMPUTATIONS OF REVISED COSTS AND PER CENT OF SAME TO TOTAL PRODUCTION IN THE UNITED STATES, 1902-1906.

Products.	Production.	Per cent of total for United States.
	Gross tons.	
Lake ore	106,268,728	73.3
Connellsville coke (net tons)	51,867,247	72.2
Total coke (net tons)	57,121,843	40.0
Bessemer pig iron	44,311,530	79.5
Basic pig iron	9,161,685	58.4
Bessemer billet ingots	29,099,783	91.6
Bessemer rail ingots	15,495,210	
Large Bessemer billets	17,151,389	(1)
Bessemer standard rails	10,618,799	77.1

[1] Probably about 90 per cent.

It is apparent, therefore, that these revised cost figures in most cases cover a very large proportion of the total production of the products specified. They include the total production of the Steel Corporation for these products. Moreover, they include all the Lake ore for which the Bureau received returns and practically all the Connellsville beehive coke included in the cost statements furnished for the period in question.

During the period 1902 to 1906 the only important companies furnishing cost statements which were outside of the districts above named, and which manufactured steel in important quantities, comprised two in the East and one in the Far West. One of the eastern companies used foreign ores chiefly, and, both on this account as well as on account of the difficulty of revising its costs on the basis planned, was naturally excluded from the computation. The other large eastern company was also excluded with respect to most products as being outside the region regarded as typical, although included for two important products.

The production of the Southern companies which furnished cost data was important only for ore, coke, and foundry pig iron. The costs of these products, as already shown above (see pp. 17, 19, and 22), were very nearly on a net basis, as shown by the books of account, and no important change would have resulted from revising them in the manner described above. Furthermore, it would have been quite improper to have combined them with the costs for the districts using Lake ore.

Owing to this difference in the extent of the industry between the costs covered by the cost statements hereafter to be given and the book costs for the country as a whole presented above (Chap. III), it was necessary, of course, to compute the book costs also for these Lake ore-using districts alone, in order that comparisons could be made between the revised costs and the proper book costs. For this reason the book costs for these districts, as shown in the next chapter, will differ slightly from those shown in Chapter III. The differences, however, are small and tend to show, as stated, that the costs for this particular region (Lake ore-using districts) are a fair basis for judging the position of the iron and steel industry in the United States.

SEPARATION OF LARGE AND SMALL COMPANIES.—A very significant feature of the comparison of revised costs with book costs to be presented later is the distinction made between the average costs of large and small companies. There were, of course, great differences between the various reporting companies in the degree of integration, and hence in the extent to which intermediate profits from transfers figure in their cost statements. It was obviously desirable, therefore, to group such companies in order to show these differences clearly. Generally speaking, the large companies were best integrated; the exceptions to this condition were comparatively unimportant when the output was taken into consideration. For the large companies, furthermore, the production processes were more comprehensive, and the tonnages so much larger that they enjoyed, on the whole, considerable technical advantages with respect to the economy of operation. It was believed that these large concerns might fairly be regarded as the representative units of the industry for the purposes of this cost discussion.

The companies whose costs of production were uniformly combined in the cost averages for large companies, so far as they produced the several products, were (1) the United States Steel Corporation, (2) the Lackawanna Steel Co. (Buffalo plant), (3) the Jones & Laughlin Steel Co., and (4) the Republic Iron & Steel Co. (Northern plants). The costs of production of the Republic Iron & Steel Co. for its Southern plants were not included in this computation, nor certain minor plants of the Lackawanna Steel Co., situated east of the Allegheny Mountains. For two products the average for the large companies includes also the costs of the Cambria Steel Co., which is located at Johnstown, only about 80 miles east of Pittsburgh, but which is generally grouped with the eastern companies.

The smaller companies whose costs of production are comprised in the averages need not be specified in detail. The number included in the statement of average costs for particular products varied considerably. They include a few companies of intermediate size, as well as more numerous companies which are more accurately described as small.

To sum up, therefore, the revised cost data presented in this portion of the report comprehend the costs for all the companies in the Lake ore-using districts. These costs are, for purposes of comparison, shown in two ways—first, in the form of the book costs already discussed (these have been computed on the basis of the costs reported by the companies), and, second, the same costs excluding transfer profits. These costs will be shown separately for large and for small companies.

Section 3. Method of eliminating transfer profits.

The elimination of profits by the Bureau was based on information furnished by the companies themselves respecting the amount of such profits. The computations were of an elaborate and complicated character and can not be well explained in detail at this time; they will be set forth in detail in the full text of the report. It is important, however, to indicate in a very general manner the methods adopted for determining transfer profits and certain general rules which governed computations before stating these revised costs themselves.

In the first place, it should be noted that the whole process of computation was conducted separately for each company and was made according to the actual circumstances of its production and consumption of the several products, with amounts of cost and profit and not by the use of averages per ton.

The several companies reporting their costs also reported their sales and profits on sales, by products, some references to which (in averages per ton) have been made above. (See pp. 18, 20, and 25.) The profits by products which have been cited above were the profits remaining after the deduction of "additional costs," which have been already explained (p. 10). As the method of allocating such additional costs is necessarily somewhat arbitrary, it is important to note that there were no additional costs to be distributed in the case of ore and coke, and hence no adjustment to be made respecting the profits thereon. It was on these two products that almost all of the transfer profits which are to be deducted were received.

One rule followed was that for deducting the profit on sales as well as on transfers, in so far as the consumption of the product in question exceeded the quantity transferred. This rule can be made clear by a brief illustration. Suppose a company produced 100,000 tons of Bessemer pig iron in a year at an average cost of $12 per ton, and sold 35,000 tons from time to time at an average price of $14 per ton, or at $2 per ton profit. Suppose it consumed in its own steel works 65,000 tons of pig iron of its own production and 10,000 tons additional purchased in the open market at an average price of $15 per ton. The direct cost of the pig-iron tonnage consumed would therefore be 65,000 tons at $12 per ton, and 10,000 tons at $15 per ton, or a total of $930,000. Against this cost, according to the rule adopted by the Bureau, there was put the profit on so much of the tonnage sold as corresponded to the quantity purchased. In the above case the profit of $2 per ton on 10,000 tons of the total tonnage sold gives $20,000. The net cost of the pig iron consumed, therefore, was $910,000. Of course, not all the profit on sales was charged, but only the profit on a quantity equal to the quantity purchased. Such transactions of purchase and sale during a year are not uncommon. They are sometimes important for companies mining and consuming ore, where a variety of grades is desirable, so that the product of one mine is sold in order to buy that of another.

It should be noted, however, that even if no credit had been given for profit on such sales, the total results arrived at would not have shown any material difference.

Another rule was that of allocating the transfer profit for a given commodity which was used in the production of two or more commodities. In such cases the rule adopted was the obvious one, namely, to prorate the profits per ton according to the tonnage consumed.

A conspicuous difficulty occurred with respect to the question of the period during which a given profit was earned and the period of production against which it should be applied in the next succeeding stage. For the steel products here under consideration, namely, ingots, billets, and rails, this is a comparatively unimportant matter, as the pig iron and subsequent materials generally move day by day with little interruption from one stage of production to another. It is of great importance, however, with the ore going into pig iron, because ore shipments are not continuous throughout the year on account of the winter closing of Lake navigation. While this fact undoubtedly introduces considerable liability to error in comparing ore profits with pig-iron costs for any single year (due chiefly to considerable fluctuations in the *price* of ore), it is not a serious matter when the business of five consecutive years is averaged.

The difficulty suggested above was partly obviated also by carrying inventories forward into the consumption of the succeeding year. The computation of the average costs for five years combined, as well as for single years, was made more accurate by the application of this obviously correct rule.

The most difficult question presented in the computation of transfer profits was in distinguishing the rates of profit on Bessemer ores and on non-Bessemer ores. The profit statements furnished to the Bureau did not make this distinction. For some companies it was unnecessary, because they produced only one variety of ore. For certain other companies it was a matter of indifference, because they made only one kind of pig iron. But for companies which produced both Bessemer and non-Bessemer ores and which likewise produced both Bessemer and basic pig iron it was necessary to divide the known ore profit between the two grades of ores. The exact manner in which this was done is too complicated to be described in detail; but, in brief, it consisted in determining the average prices and profits on the ores from a comparison of the actual average prices and average costs of the ores for all ranges and grades with the official prices for the Bessemer and non-Bessemer ores for the Mesabi and Old Ranges. This required an allotment of tonnages by ranges and by grades, which in both cases involved some approximations, also certain adjustments to make tonnages shipped proportional to tonnages mined, and certain other adjustments for special sales below the market price, etc.[1]

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[1] The Bureau's methods and results in computing the approximate division of profit between Bessemer and non-Bessemer ores are partly indicated here and will be fully explained in the full report.

The actual average prices, profits, and costs for the sales and transfers of 109,424,041 tons of Lake ore during the five years 1902–1906 which were reported to the Bureau were as follows:

AVERAGE COSTS, PRICES, AND PROFITS ON LAKE ORE, PER GROSS TON, BY YEARS, 1902–1906.

Year.	Tonnage.	Cost per ton.	Price per ton.	Profit per ton.
1902	20,111,011	$2.77	$3.34	$0.57
1903	17,627,423	2.70	3.57	.87
1904	16,555,393	2.70	3.06	.36
1905	26,093,788	2.58	3.18	.60
1906	29,036,426	2.64	3.47	.83
1902–1906	109,424,041	2.67	3.33	.66

The final allocation of these prices, profits, and costs to the two grades of ore for the Mesabi and Old Ranges, respectively, the details of which will be shown in the full report, was as follows:

ACTUAL AVERAGE PRICES, COSTS, AND PROFITS ON SALES AND TRANSFERS OF ALL LAKE ORE, PER GROSS TON, REPORTED TO THE BUREAU, AND ESTIMATED DIVISION OF THE SAME FOR BESSEMER AND NON-BESSEMER ORES, BY YEARS, 1902–1906.

Year.	Grade.	Tons.	Cost.	Price.	Profit.
1902	Bessemer	13,000,000	$2.71	$3.53	$0.82
	Non-Bessemer	7,100,000	2.88	2.98	.10
	Total	20,100,000	2.77	3.34	.57
1903	Bessemer	11,700,000	2.64	3.77	1.13
	Non-Bessemer	5,900,000	2.81	3.17	.36
	Total	17,600,000	2.70	3.57	.87
1904	Bessemer	11,200,000	2.66	3.19	.53
	Non-Bessemer	5,300,000	2.82	2.80	[a].02
	Total	16,500,000	2.70	3.06	.36
1905	Bessemer	17,200,000	2.54	3.32	.78
	Non-Bessemer	8,900,000	2.66	2.91	.25
	Total	26,100,000	2.58	3.18	.60
1906	Bessemer	19,100,000	2.59	3.59	1.00
	Non-Bessemer	9,900,000	2.71	3.22	.51
	Total	29,000,000	2.64	3.47	.83
1902–1906	Bessemer	72,200,000	2.62	3.48	.86
	Non-Bessemer	37,100,000	2.76	3.03	.27
	Total	109,300,000	2.67	3.33	.66

[a] Loss.

While the total average profits for each year were compiled from books of account, the profits for the two grades of ore are approximate and apply to the particular tonnages comprised in the above table.

The principal interest of this table lies in the fact that it was the basis for apportioning the profits on Bessemer and non-Bessemer ore for the Steel Corporation. Of course, the greater part of the tonnage shown in this table was that of the Steel Corporation. For the Steel Corporation alone, however, the average profits per ton in each year varied slightly from the averages shown above, and adjustments were made accordingly in the computations for that concern.

Separate treatment was made of ore sales and ore transfers in making these adjustments on account of the marked differences in the average prices at which such sales and transfers were made.

As just noted, while in the determination of these profits on ore certain approximations were necessary, yet the average profit for both Bessemer and basic pig iron combined is a known amount derived from the records submitted by the companies. There is, moreover, no doubt that this allocation of the total profits as between Bessemer and basic iron is substantially correct.

Section 4. Principal products for which transfer profits were deducted.

The principal items of transfer profit were for ore and coke, and to a less extent for pig iron and certain minor raw materials, such as ferromanganese. The profits on all ore and coke entering the net metallic mixture and coke items, respectively, in the pig-iron cost sheets were deducted from the costs of these items, thus giving the net costs. In the cost of ingots these deductions appear again in the reduced cost of the pig iron and scrap along with any deductions on account of intermediate profits on pig iron, so far as they were applicable to the production of the ingots in question. Similar deductions were made from manganese costs on account of intermediate profits in the ferromanganese or other similar additions to the metal. As these deductions resulted in a revised cost for the ingots, they likewise affected in a similar manner the cost of ingots used in making rails and large billets.

CHAPTER V.

COMPARISON OF BOOK COSTS FOR 1902–1906 WITH COSTS AFTER ELIMINATION OF INTERMEDIATE TRANSFER PROFITS.

Section 1. Introductory.

Having made clear the general principles followed by the Bureau in determining the amount of transfer profits to be eliminated, it now remains to compare the costs computed in the two ways noted on page 6, namely, (1) book cost,[1] and (2) book cost less intermediate transfer profits. These costs are shown not only for all companies combined, but also, as far as practicable, grouped for large companies and small companies. For convenience and brevity the different forms of statement are presented side by side.[2]

Owing to the nature of the information, it was impracticable, as already stated, to carry such revision of costs beyond crude steel, except for two of the most important rolled products—Bessemer rails and large Bessemer billets.

Section 2. Comparison of costs for Lake ore.

The present section takes up ore costs for all the companies reporting, combined, and includes the Steel Corporation in those figures.

The costs of Lake ore require only one insignificant elimination, namely, a very small intermediate profit from intercompany royalty. That there are no intermediate transfer profits on materials is due, of course, to the fact that ore is an original raw material. There is, of course, a large and very important transportation profit in the carriage of ore, but accruing almost entirely to the Steel Corporation; on account of this circumstance, as already made clear, this profit is not to be eliminated in these comparisons of average costs for several companies, but the extent of it will be shown in detail at the end of this chapter, and will be taken up in Chapter VII, as already noted, in connection with the costs of the Steel Corporation alone for the year 1910.

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[1] Except for ore for which only a trifling deduction for intermediate profits was necessary.

[2] The costs which are shown in this chapter do not cover all the cost statements furnished to the Bureau as stated above (p. 38), but that part for the production of the chief Lake ore-using districts, which, however, comprised the great bulk of the production of the country. (See Table 8.) For some products, e. g., Lake ore and Bessemer billet ingots, it comprises the total tonnage reported to the Bureau.

TABLE 9.—AVERAGE BOOK COST PER GROSS TON OF LAKE ORE AT LOWER LAKE PORTS, EXCLUDING INTERCOMPANY ROYALTY, DISTINGUISHING LARGE AND SMALL COMPANIES, 1902-1906.

Items of cost.	All companies (106,268,728 tons).	Large companies (84,920,942 tons).	Small companies (21,347,786 tons).
Labor	$0.45	$0.44	$0.50
Other operating	.37	.38	.34
Royalty	.23	.23	.21
Mine cost	1.05	1.05	1.05
Rail freight	.67	.69	.58
Lake freight	.74	.74	.74
Lower Lake cost	2.46	2.48	2.37
General expense, depreciation, and taxes	.16	.16	.12
Total cost at lower Lake ports	2.62	2.64	2.49

The costs as shown in this table differ from the book costs shown above (p. 16) in two respects only. First, they distinguish all companies, and large and small companies, and, second, they show the costs after eliminating intercompany royalties. Inasmuch as the changes in costs on account of the elimination of intercompany royalties were very slight, it is unnecessary to show the book costs together with the same costs after eliminating such intercompany royalties. The intercompany royalties averaged only $0.02 per ton for all companies combined, and $0.03 for the large companies, while for the small companies there was no deduction on this account.

After making this small deduction, the average mine cost was the same for the three groups shown, namely, $1.05 per ton. There were, however, some differences in the various items for the different groups. Thus for the item of labor, which represents the direct labor cost only, the average for all companies was $0.45 per ton, as compared with $0.44 per ton for the large companies and $0.50 per ton for the small companies. The higher cost of labor for the small companies was largely offset, however, by lower costs for other operating expenses, namely, $0.34 for the small companies, as compared with $0.38 for the large companies. The small companies also showed a lower average royalty, even after the deduction of intercompany royalties, the average for the small companies being $0.21 per ton, as against a net average royalty of $0.23 for the large companies. A good many fee-ore mines (largely in the Marquette Range) were in the small-company group. These having, of course, no royalty, tended to reduce the average royalty cost of that group as a whole.

The small companies showed a lower average rail freight, principally due to the fact that no mines in the Vermilion Range were included among them, the average being $0.58 per ton, as against $0.69 for the large companies. On the other hand, their average

Lake freight charge happened to be just the same as for the large companies, namely, $0.74 per ton.

The small companies also had, on the average, smaller additional expenses for general administration, depreciation, and taxes, namely, $0.12 per ton, as compared with $0.16 for the large companies.

Consequently the small companies happened to have a lower average total cost at lower Lake ports, namely, $2.49 per ton, as compared with $2.64 for the large companies, a difference of $0.15 per ton. This advantage of the small companies was not due, however, to cheaper mining as such, but to different conditions with respect to royalty and freights. It should be distinctly understood that the small companies whose ore costs are shown here, for the most part, are not the same small companies for which the average costs of pig iron are given later.

These figures show the average costs of ore at lower Lake ports, but not, of course, at the furnace. While some of the consuming furnaces are located at lower Lake ports, the net costs of a particular furnace can not be figured from these averages.

For the average of all the furnaces using Lake ore, a considerable amount of rail freight has to be added because most of them are located at a considerable distance south of the Great Lakes.

As has been clearly explained above, these costs of ore at lower Lake ports do not contain any deduction on account of the large profits from the transportation of ore which are made by a few ore-producing interests, and, in fact, almost entirely by the Steel Corporation. The effect of such transportation profits on the net cost of ore at lower Lake ports is taken up, therefore, at the end of this chapter and also in another chapter (see Chap. VII), namely, in the discussion of the integration costs of the Steel Corporation for the year 1910.

Section 3. Comparison of costs of coke.

The coke produced by the companies which are considered in these computations of revised costs was of three kinds—(1) Connellsville coke, (2) Pocahontas coke, and (3) by-product coke. In none of these three was there any profit included in the coke costs themselves, on account of the transfer prices of coal, which could be excluded on the basis of data furnished the Bureau. (In the subsequent use of such coke in making pig iron, however, there was a considerable transfer profit, as noted on p. 50.) Furthermore, with respect to the differences between large and small companies, it should be noted that practically all the Connellsville coke (beehive) for which the Bureau had returns was made by the large companies, and likewise all the by-product coke. As to Pocahontas coke, it was not practicable to show the cost of large and small companies separately. Taking all the coke production of the companies here under consideration, it would be possible, however, to distinguish the costs of the large companies from the costs of the small companies, but there would be little utility in presenting the figures because averages of the items of coke cost for districts working under such different conditions would have almost no significance. It is sufficient, therefore, to note that the average cost of coke at the oven for all the companies here under consideration was $1.49 per net ton. The average costs at the oven for all companies, for the several kinds of coke, for the five-year period 1902 to 1906, were as follows:

	Per net ton.
Connellsville (51,867,247 tons)	$1.43
Pocahontas (4,170,396 tons)	1.74
By-product (1,084,200 tons)	3.43
Average	1.49

For most of this coke a considerable freight has to be paid to get the coke to the blast furnace; i. e., for all coke except the by-product coke.

For the Connellsville coke and the Pocahontas coke, these average costs are the same as for the total production already given, although the tonnage in the case of the former is not quite so large (p. 18). For the by-product coke, the average costs here shown are considerably higher than for the average costs of all by-product coke reported to the Bureau, which is shown elsewhere (p. 19). The details as to differences in items are not of any special importance.

Section 4. Comparison of costs of Bessemer pig iron.

The book costs of Bessemer pig iron are compared with the costs after the elimination of intermediate transfer profits on ore and coke. The costs of the large and small companies are distinguished in each case. They are for the Lake ore-using districts only. (See p. 38.)

TABLE 10.—AVERAGE BOOK COST PER GROSS TON OF BESSEMER PIG IRON AND COST EXCLUDING TRANSFER PROFITS, DISTINGUISHING LARGE AND SMALL COMPANIES, 1902–1906.

Items of cost.	All companies (44,311,530 tons).		Large companies (40,873,250 tons).		Small companies (3,438,280 tons).	
	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.
Net metallic mixture	$7.36	$6.10	$7.38	$6.01	$7.20	$7.14
Coke	3.81	3.28	3.75	3.19	4.41	4.41
Limestone	.43	.43	.43	.43	.49	.49
Labor	.73	.73	.69	.69	1.26	1.26
Other operating	.80	.80	.79	.79	.82	.82
Furnace cost	13.13	11.34	13.04	11.11	14.18	14.12
Additional costs	.76	.76	.82	.82	.09	.09
Total cost	13.89	12.10	13.86	11.93	14.27	14.21

Comparison of book costs.—The table shows that the average Bessemer pig-iron costs of the large companies even before the elimination of antecedent transfer profits were distinctly lower than those of the small companies, the furnace costs being, respectively, $13.04 and $14.18 per ton, giving an advantage for the large companies of $1.14 per ton. The chief differences between the furnace costs of the large and small companies are found in the costs of ore, coke, and labor. The ore cost of the large companies was indeed higher, being booked at $7.38, or $0.18 higher than that of the small companies, $7.20 per ton; the difference was chiefly due to location of furnaces. As stated above (p. 47), the small companies for which the costs of pig iron are shown here are not, generally speaking, the same small companies for which average costs of ore were shown above. The disadvantage of the large companies in respect to book cost of ore was more than offset in the book cost of coke. The large companies, with an average book cost of coke of $3.75 per ton, had an advantage of $0.66 per ton over the small companies ($4.41). In this case also location was the chief factor.

The net advantage of location with respect to these two materials may be roughly estimated, therefore, at $0.48 for the large companies.

The chief advantage of the large companies was, however, in the labor cost, namely, $0.69 per ton, as compared with $1.26 for the small companies—a difference of $0.57 per ton. This was due chiefly to differences in efficiency of plants, volume of production, etc., and was perhaps partly the natural result of a larger investment of capital per ton of product. Of course, even where the investment is not greater in proportion to output, it is generally possible to have a more efficient equipment with large tonnages of product than with small ones.

The other items of furnace cost noted in the foregoing table did not show any marked differences between large and small companies.

As already stated elsewhere (p. 24), the "additional costs" probably were not made on a comparable basis, those for the large companies being, on the average, undoubtedly too high, and those for the small companies probably being too low. Such "additional costs" for the large companies might be expected to run higher, especially on account of more elaborate technical organization and equipment intended to reduce operating costs. A more detailed statement of these additional costs follows:

Items.	Large companies.	Small companies.
General and miscellaneous expense	$0.40	....
Depreciation	.42	$0.09
Total	.82	.09

The general and miscellaneous expenses were considerable for the large companies, partly on account of their more complicated organization. Some costs comprehended therein were probably put by the smaller companies in their furnace costs, although this probably was not the case to any great extent. It is very plain, however, that the large companies made very heavy charges for depreciation as compared with the small companies. Some difference in this respect may have been necessary, owing to the more elaborate equipment of the large companies; but it must be remembered that this depreciation is reckoned per ton of product, and more elaborate equipment tends to facilitate larger tonnages. In other words, more extensive plant investment is not synonymous with greater investment per ton of product, or with greater depreciation per ton of product. For depreciation alone, however, $0.40 per ton is regarded as ample, while general expenses properly chargeable to blast furnaces are undoubtedly small for steel-making companies.

Bearing these facts in mind, the total book costs of large and small companies shown in the foregoing table may be noted, namely, $13.86 per ton of pig iron for large companies and $14.27 for small companies, giving a difference of $0.41 per ton in favor of the former.

If instead of these additional costs an assumed normal allowance for such costs (see p. 24), namely, $0.50 per ton, be added, the total book costs would be $13.54 for the large companies and $14.68 for the small companies—a difference of $1.14 per ton.

COMPARISON OF COSTS OF ALL COMPANIES AFTER ELIMINATION OF INTERMEDIATE TRANSFER PROFITS.—There were great differences between the average book costs of all the companies combined and these costs after eliminating antecedent profits from transfers of materials. These differences were far greater for large companies than for small companies.

The only items of cost which are changed by the revision are for net metallic mixture and coke. As shown on the books, the average cost of the net metallic mixture for all companies was $7.36 per ton of pig iron. The elimination of transfer profits reduced this, however, to $6.10 per ton, a difference of $1.26 per ton. This corresponds to a transfer profit on the ore consumed of approximately $0.70 per ton, about 1.8 tons of ore being used on the average to produce a ton of Bessemer pig iron.

The transfer profits eliminated from the cost of coke reduced the book cost for all companies from $3.81 per ton of pig iron to a cost of $3.28 per ton, a reduction of $0.53 per ton. A little more than a net ton of coke was used on the average for a ton of pig iron, and the transfer profit was about $0.46 per net ton of coke used.

On account of these differences in particular items the total furnace costs necessarily differed greatly. The average furnace cost for all companies, as shown on the books, was $13.13 per ton of pig iron, as against $11.34 per ton, after taking out the transfer profits. Corresponding differences existed for the total costs before and after such revisions. Thus the total book cost was $13.89 per ton of pig iron; or, less transfer profits, $12.10 per ton.

It should be distinctly borne in mind, of course, that as these differences were due to the elimination of profits derived from preceding stages of production, it is logical that the costs should be lower in order that there may be a larger margin of profit to furnish a return to the larger investment involved.

COMPARISON OF COSTS OF LARGE AND SMALL COMPANIES AFTER EXCLUDING INTERMEDIATE TRANSFER PROFITS.—The great reductions in cost which are shown above were more characteristic of the large companies than of the small companies, because the former, generally speaking, were more completely integrated, and consequently earned larger profits from antecedent stages of production.

Thus, while the large companies showed higher book costs for net metallic mixture than the small companies, the cost of this item, after eliminating the transfer profits, was very much lower for them, namely, $6.01 per ton of pig iron, as against $7.14 per ton. The small companies, on the average, showed very little profit on this account—only $0.06 per ton, as against $1.37 for the large companies.

In the case of coke there was no intermediate transfer profit for the small companies, while that for the large companies averaged $0.56 per ton.

Consequently the average furnace cost after the elimination of transfer profits showed $11.11 per ton for the large companies, as compared with $14.12 per ton for the small companies.

These marked differences in furnace costs are somewhat diminished, when the total costs are compared, on account of the greater "additional costs" of the large companies. (See p. 10.) Eliminating transfer profits, the total cost for the large companies was $11.93 per ton, as compared with $14.21 for the small companies, a difference of $2.28 per ton.

If the additional costs were taken as equal for each group of companies at $0.50 per ton (see p. 24), the difference would have been $3.01.

While in this revision of book costs the Bureau is not attempting to eliminate any profits except those from the transfers of materials, it should be remembered that if transportation profits on ore (see p. 70) were also eliminated the reduction in the cost of pig iron resulting therefrom would have been much greater, of course, than in the case of ore, inasmuch as about 1.8 tons of ore are required to make a ton of Bessemer pig iron. The same would be true also in the case of other kinds of pig iron. Moreover, for steel products made from pig iron there would be a still larger deduction on account of the larger quantities of ore required per ton of product. This general fact is noted here and need not be repeated in discussing the costs of other kinds of pig iron or for steel products made therefrom.

Section 5. Comparison of costs of basic pig iron.

The book costs of basic pig iron in the Lake ore-using districts (see p. 38) are likewise compared with the costs after the elimination of intermediate transfer profits on ore and coke. The costs of the large and small companies are likewise distinguished in each case.

TABLE 11.—AVERAGE BOOK COST PER GROSS TON OF BASIC PIG IRON AND COST EXCLUDING TRANSFER PROFITS, DISTINGUISHING LARGE AND SMALL COMPANIES, 1902–1906.

Items of cost.	All companies (9,161,685 tons).		Large companies (8,466,492 tons).		Small companies (695,193 tons).	
	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.
Net metallic mixture	$7.15	$6.69	$7.17	$6.69	$6.90	$6.68
Coke	3.32	2.79	3.26	2.68	4.11	4.11
Limestone	.47	.47	.46	.46	.64	.64
Labor	.60	.60	.57	.57	1.06	1.06
Other operating	.75	.75	.71	.71	1.10	1.10
Furnace cost	12.29	11.30	12.17	11.11	13.81	13.59
Additional costs	.52	.52	.54	.54	.31	.31
Total cost	12.81	11.82	12.71	11.65	14.12	13.90

COMPARISON OF BOOK COSTS.—The average costs of basic pig iron for large companies, even before the elimination of antecedent transfer profits, were distinctly lower than those of small companies,[1] the furnace costs being, respectively, $12.17 and $13.81 per ton, giving an advantage for the large companies of $1.64 per ton. Considerable differences appear in the costs of each item shown.

The ore cost of the large companies as shown in the above table exceeded that of the small companies by $0.27 per ton. For coke, however, the book costs were considerably lower for the large companies, namely, $0.85 less per ton. The large companies had also an advantage in the cost of limestone, which on the average amounted to $0.18 per ton. Location of furnaces was undoubtedly the principal factor in these differences in cost of ore, coke, and limestone. Other reasons have already been made clear.

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[1] The small companies whose pig-iron costs are shown here are by no means identical with those whose ore costs are shown in Table 9.

The large companies had a labor cost of only $0.57 per ton, as against $1.06 for the small companies, showing a difference of $0.49 per ton. This was due chiefly to differences in efficiency of plants, volume of production, and to some extent perhaps involved larger investments per ton of product. Likewise for other operating costs the large companies enjoyed a distinct advantage, amounting to no less than $0.39 per ton. Over half of this difference was due to the cost of steam, the details not being given in the foregoing table.

The large companies had greater additional costs allotted to basic pig iron which tended to diminish their advantage in total costs over the small companies. These additional costs, stated in more detail, were as follows:

Items.	Large companies.	Small companies.
General and miscellaneous expense	$0.28	$0.15
Depreciation	.26	.16
Total	.54	.31

The differences in these items for the large and the small companies were not nearly as conspicuous for basic pig iron as for Bessemer pig iron, and consequently the comments made with respect to the latter (p. 50) would apply only in a slight degree in this case.

The total book costs for basic pig iron showed an average of $12.71 per ton for the large companies and $14.12 for the small companies, giving a difference of $1.41 per ton.

If an assumed normal additional cost of $0.50 per ton were used instead, the total cost for the large companies would be $12.67 per ton, as against $14.31 for the small companies—a difference of $1.64.

COMPARISON OF COSTS OF ALL COMPANIES AFTER ELIMINATION OF INTERMEDIATE TRANSFER PROFITS.—Although the antecedent profits involved in the book costs of basic pig iron were not as large as for Bessemer, there were, nevertheless, great differences between the book costs and these costs after eliminating the profits on transfers of materials. These differences were much more marked also for large companies than for small companies.

In basic pig iron, as in Bessemer pig iron, the only items of cost which were changed by these eliminations were the items for net metallic mixture and coke. Taking first the average for all companies, the book cost of the net metallic mixture was $7.15 per ton of pig iron, and eliminating the transfer profits on ore this was reduced to $6.69 per ton, a difference of $0.46 per ton. Taken on a ton of ore, this would amount to about $0.23 per ton. The profits on the non-Bessemer ore used in making basic pig iron are much lower than for Bessemer ore, inasmuch as the prices are much lower, while the costs of non-Bessemer ore averaged a little higher.

For coke the average book cost for all companies was $3.32 per ton of pig iron, and this cost less transfer profit was $2.79 per ton, giving a difference of $0.53 per ton. Figured per net ton of coke used, this would be about $0.46 per ton.

On account of these eliminations of antecedent profits, there were marked differences in the average furnace costs of basic pig iron. Thus, against the book furnace cost of $12.29 per ton for all companies, the elimination of transfer profits gave $11.30 per ton, showing a difference of $0.99 per ton.

Corresponding differences existed in the total costs before and after such eliminations, the average total costs per ton being, respectively, $12.81 and $11.82.

As stated before (p. 51), these transfer profits applied to productive activities in prior stages of production, and hence the margins between cost and price should be greater after such eliminations, in order to furnish any return on the investment in such prior productive enterprises.

COMPARISON OF REVISED COSTS FOR LARGE AND SMALL COMPANIES.—The costs of the net metallic mixture for the large companies ($7.17 per ton), as shown on the cost sheets, averaged higher than for the small companies ($6.90), as already shown (p. 52), but after the transfer profits on ore were eliminated in each case these costs were practically the same for these two groups, namely, $6.69 per ton of pig iron and $6.68 per ton, respectively.

The coke cost of the large companies was reduced by the elimination of transfer profits from $3.26 per ton of pig iron to $2.68 per ton, or $0.58 per ton, while for small companies it was not reduced at all.

Consequently the average furnace cost after the elimination of transfer profits showed $11.11 per ton for the large companies, as compared with $13.59 per ton for the small companies, giving a difference of $2.48 per ton.

Owing to the fact that the additional costs of the large companies were considerably larger than for the small companies, the revised total costs did not differ so greatly as the revised furnace costs. Thus, eliminating transfer profits, the total cost for the large companies was $11.65 per ton, as against $13.90 for the small companies, giving a difference of $2.25 per ton.

If the additional cost were assumed to be $0.50 in each case (see p. 24), the difference in the costs of large and small companies would have been $2.48.

Section 6. Comparison of costs for Bessemer and basic pig iron combined.

For ordinary cost statements, at least according to the forms of accounting usually followed, a combination of Bessemer and basic pig-iron costs would be of little value. This is due, of course, to the fact that the ores used are customarily charged at market prices, and that the prices for the two grades of ore used in making these kinds of pig iron are widely different.

For the present purpose, however, two reasons appear for combining the costs of Bessemer and basic pig iron. In the first place, the method of distinguishing the profit on Bessemer and non-Bessemer ores (see p. 42) was only approximate. The results obtained are believed to have been close enough to the actual facts, so that the difference was of no practical importance. Even in strict accounting statements there are many approximations which contain probability of greater variations than in this case. Nevertheless, a result arrived at by such a method is not always satisfactory and sometimes not so convincing as one which is based on the use of a definite amount of profit. Evidently by combining the total amounts of cost of Bessemer and basic pig iron and eliminating all the ore profits from this cost, any possible objections to the Bureau's approximate method of dividing the ore profits are completely avoided.[1]

In the second place, it should be noted that a combination of Bessemer and basic pig-iron costs, while comparatively meaningless when the ores are put in at market prices, is not so when the ores are put in at cost, or at figures approximating cost.

The revised averages do not, of course, give a furnace cost for ore which is an absolute cost of production, plus freight, to the furnace, because a good many concerns had to purchase a part of their ore and some of the smaller ones all of it. For the large companies the revised cost of the ore (net metallic mixture) found by eliminating transfer profit is very nearly the cost of the ore at the furnace, including full transportation charges.

Hence, while the costs of both Bessemer and basic pig iron combined are shown in the table below in the same form as above, the results which are of interest are comparatively limited, and may be more briefly described. These costs are for the Lake ore-using districts only. (See p. 38.)

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[1] A slight exception must be made to this statement of the process with respect to the small and practically negligible estimated amounts of profit on both Bessemer and non-Bessemer ores credited by the Bureau to the costs of ore used in basic open-hearth furnaces, and in very small tonnages of miscellaneous pig iron, such as foundry and malleable Bessemer.

TABLE 12.—AVERAGE BOOK COST PER GROSS TON OF BESSEMER AND BASIC PIG IRON COMBINED AND COST EXCLUDING TRANSFER PROFITS, DISTINGUISHING LARGE AND SMALL COMPANIES, 1902–1906.

Items of cost.	All companies (53,473,215 tons).		Large companies (49,339,742 tons).		Small companies (4,133,473 tons).	
	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.
Net metallic mixture	$7.33	$6.20	$7.34	$6.13	$7.15	$7.06
Coke	3.72	3.20	3.67	3.10	4.36	4.36
Limestone	.44	.44	.43	.43	.52	.52
Labor	.71	.71	.67	.67	1.22	1.22
Other operating	.79	.79	.78	.78	.87	.87
Furnace cost	12.99	11.34	12.89	11.11	14.12	14.03
Additional costs	.72	.72	.77	.77	.13	.13
Total cost	13.71	12.06	13.66	11.88	14.25	14.16

An inspection of this table shows at once that in this combined pig-iron cost the elimination of transfer profits had practically no effect on the small companies. Inasmuch as the revised costs for all companies for Bessemer and basic separately have already been discussed in detail, it will be sufficient to consider here the results for large companies only.

For the large companies the average book cost of the net metallic mixture was $7.34 per ton, but the elimination of the transfer profits reduced it to $6.13 per ton. This latter figure may be compared with $6.01 for Bessemer pig iron and $6.69 for basic pig iron for this item for this group of large companies. The reason why the net cost of this item was higher for basic than for Bessemer was due chiefly to differences in the locations of the groups of furnaces making these two kinds of iron, though also to the different amounts of profit in the ore which were eliminated from the book prices.

The cost of coke, after eliminating transfer profits, for Bessemer and basic pig iron combined, for the large companies, was $3.10 per ton of pig iron, as compared with a book cost of $3.67, showing a difference of $0.57 per ton of pig iron and indicating a profit of about $0.50 per net ton of coke. This net cost may be compared with $3.19 per ton of coke for Bessemer and $2.68 for basic furnaces. The net cost for the basic furnaces was lower, chiefly on account of lower freight charges.

The other items of furnace cost for Bessemer and basic pig iron combined, for the large companies, did not undergo any change through the elimination of profits, while the costs per ton for the several items were nearly the same as for Bessemer pig iron, on account of the preponderance of tonnage for that grade.

The furnace cost for both grades of iron combined, for the large companies, after eliminating transfer profits, was $11.11 per ton. It happens that this was also the furnace cost of both Bessemer and basic separately after the elimination of transfer profits. If the additional costs are taken into consideration, however, the combined cost becomes $11.88 per ton, as against $11.93 for Bessemer and $11.65 for basic. This combined total cost of Bessemer and basic pig iron, for the large companies, excluding these transfer profits, namely, $11.88, may be regarded as coming close to a normal net cost of pig iron for large integrated companies during the period 1902 to 1906.

It should be repeated, however, that a concern with exceptional transportation facilities, such as the Steel Corporation, would have a much lower integration cost if transportation profits were eliminated, as well as transfer profits.

Section 7. Comparison of costs of Bessemer billet ingots.

The great bulk of the steel made during the period 1902 to 1903, inclusive, was made by the Bessemer process. This steel may be divided into two kinds, namely, billet (or soft) steel and rail steel. The former is covered by the term "Bessemer billet ingots." The production included is the same as that shown in Table 6. The costs of this steel, before and after the elimination of antecedent profits from transfers of materials, showing the costs of large and small companies, are given in the following table:

TABLE 13.—AVERAGE BOOK COST PER GROSS TON OF BESSEMER BILLET INGOTS AND COST EXCLUDING TRANSFER PROFITS, DISTINGUISHING LARGE AND SMALL COMPANIES, 1902-1906.

Items of cost.	All companies (29,099,783 tons).		Large companies (27,519,174 tons).		Small companies (1,580,609 tons).	
	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.
Pig iron and scrap	$14.88	$12.84	$14.73	$12.62	$17.53	$16.67
Manganese	.31	.28	.31	.28	.37	.37
Fuel	.24	.22	.23	.20	.46	.46
Labor	.57	.57	.55	.55	.89	.89
Other operating	.64	.64	.63	.63	.71	.71
Works cost	16.64	14.55	16.45	14.28	19.96	19.10
Additional costs	.92	.92	.98	.98	.02	.02
Total cost	17.56	15.47	17.43	15.26	19.98	19.12

COMPARISON OF BOOK COSTS.—There were marked differences in the costs of the large and small companies as shown by the books of account. Thus the average book cost of ingots at the steel works for all companies was $16.64 per ton; for large companies it was $16.45 per ton; and for small companies $19.96 per ton, or $3.51 per ton higher than for large companies. This difference was due chiefly to the higher cost of the metal used, but also in part to higher costs for other items.

The book cost of the pig iron and scrap used was $14.73 per ton of steel for the large companies and $17.53 for the small companies, giving a difference of $2.80 per ton in favor of the large companies. A part of this difference was due to the fact that the small concerns which used their own pig iron had higher furnace costs; a part was due to the fact that the small companies had to purchase a much greater proportion of the pig iron used than the large companies, and this involved, of course, paying market prices and freights to the steel works for it instead of furnace costs. The large companies had very little expense on these accounts, as they purchased a comparatively small proportion of their pig iron during this five-year period. Nevertheless, they purchased some, and this tended to increase the average cost of their pig iron and scrap used.

For the same reasons the book cost of manganese was higher for the small companies than for the large companies, namely, $0.37 per ton of steel, as against $0.31.

The small companies were also at a disadvantage with respect to the cost of fuel—i. e., coke used in remelting cold pig iron and scrap in cupola furnaces—this book cost of fuel per ton of steel being $0.46 for them, as against $0.23 for the large companies. This shows clearly, of course, not only the much greater use of cold metal, but also indirectly confirms the statement that a larger proportion of the pig iron and scrap used by small companies was purchased.

Labor costs of the small companies were also higher, their average being $0.89 per ton of steel, as compared with $0.55 for the large companies. This was partly due to their less efficient equipment in labor-saving devices, smaller volume of production, etc., but probably more particularly to the fact that they bought a greater proportion of pig iron and scrap, so that a greater expense for labor in remelting the metal at the cupola furnaces was involved.

The fact that other operating expenses were higher for the small companies than for the large companies was chiefly due to the same reasons just given with respect to labor cost. These were $0.71 per ton for the small companies, as against $0.63 for the large companies.

The greater works cost of the small companies, as shown on the books, was partly offset by lower additional expenses. The allocations as made from the profit and loss statements were only $0.02 per ton of steel for the small companies, as against $0.98 for the large companies. In more detail these were as follows:

Items.	Large companies.	Small companies.
General and miscellaneous expense	$0.49	....
Depreciation	.49	$0.02
Total	.98	.02

The reasons for the differences and the criticism of them are substantially the same as for Bessemer pig iron (p. 50), and need not be repeated here. The cumulative character of these additional costs, due to the usual system of charging the pig iron to the steel works at furnace cost, without respect to the additional costs shown by the Bureau, has already been explained elsewhere (p. 29). Of course, in comparing these additional costs due allowance must be made for the fact that the group of small companies varies considerably for each product. This explains why the additional cost for these ingots for small companies is less than the additional costs for Bessemer pig iron for small companies.

The total book costs of the large companies and of small companies per ton of steel were $17.43 and $19.98, respectively, showing a difference of $2.55 per ton.

Instead of using the foregoing additional costs, an assumed normal cost for general expense and general depreciation for Bessemer steel works may be used, including, of course, the cumulative cost of pig iron on the same basis (see p. 29), namely, $0.60 per ton. In that case the total cost for the large companies would be $17.05 and for the small companies $20.56 per ton—a difference of $3.51.

COMPARISON OF COSTS AFTER ELIMINATION OF INTERMEDIATE TRANSFER PROFITS.—The elimination of antecedent profits on transfers of materials used greatly reduced the costs of these Bessemer billet ingots for all companies combined, these effects being, of course, much more conspicuous for the large companies than for the small companies.

The only items of cost affected by such eliminations were pig iron and scrap, manganese, and fuel (coke).

The book costs for all companies showed a cost for pig iron and scrap of $14.88 per ton. The elimination of transfer profits made the cost $12.84, or $2.04 per ton lower. This transfer profit combines, of course, all transfer profits in the ore and coke used in the pig iron, as well as any profit on the transfer of the pig iron itself. Generally speaking, however, the pig iron was not transferred at a profit, so that this factor was of very slight importance.

The profits in manganese relate to the same sources as for pig iron, being small quantities of profit on account of ore and coke used in making ferromanganese and spiegeleisen, as well as for transfer profits for this material itself. Eliminating the transfer profits, the average manganese cost for all companies was reduced from $0.31 per ton of steel to $0.28 per ton.

The profits eliminated from the cost of fuel relate to the transfer profits on the coke used in the cupola furnaces. The quantity of coke required for this purpose is very small per ton of steel produced. The transfer profits on such coke resulted in reducing this fuel cost from $0.24 per ton of steel to $0.22 per ton for the average of all companies.

The total book cost for all companies, including additional costs, was $17.56 per ton; the elimination of transfer profits reduced this to $15.47 per ton. The reduction from book cost was therefore $2.09 per ton.

The fact that these reductions were greater than those for pig iron is due chiefly to the fact that more than 1 ton of pig iron and scrap is required to produce a ton of steel, on account of waste in conversion. As repeatedly shown, these profits go back chiefly to the raw materials. The amount of transfer profit on pig iron as such was of very little significance against the total tonnage used.

It should be repeated here that the elimination of these antecedent profits, while it reduces cost and tends to show a greater margin between cost and price, makes it necessary, on the other hand, to take account of the fact that the investment in several prior stages of production must be covered by whatever margin of profit may result therefrom.

The profits eliminated from the cost of Bessemer billet ingots had reference chiefly to the large companies. The only item of cost of the small companies which was affected by these profit eliminations was pig iron and scrap. The whole discussion of the revised costs of the small companies may be dismissed, therefore, with the simple comment that the cost of the pig iron and scrap was reduced from $17.53 per ton of ingots to $16.67 per ton, giving a difference of $0.86 per ton. An equal difference naturally resulted in the revised works costs and revised total costs of the small companies with respect to this product.

For the large companies, the elimination of transfer profits reduced the cost of the pig iron and scrap from $14.73 per ton of steel to $12.62 per ton, giving a difference of $2.11 per ton.

The change in the cost of manganese due to the elimination of transfer profits was $0.03, and revised manganese costs appear, therefore, at $0.28 per ton.

The only other change in the items of cost resulting from the elimination of antecedent transfer profits was for profits included in the book cost of fuel—i. e., cupola coke. The average book cost per ton for the large companies was $0.23, which was reduced to $0.20 per ton by the elimination of transfer profit on the cupola coke.

In consequence of the changes in these three items, the works cost of Bessemer billet ingots for the large companies was reduced from a book figure of $16.45 per ton to $14.28 per ton. The elimination of the transfer profits thus reduced the book cost by $2.17 per ton. Corresponding reductions resulted, of course, in the total costs of the large companies, which were $17.43 and $15.26 per ton, respectively.

The difference in total cost (excluding transfer profits) between large and small companies, as shown by the foregoing table, was $3.86. If an assumed normal charge for additional general expense and depreciation ($0.60) were added to the works cost of the large and small companies, the difference after eliminating transfer profits would have been $4.82 per ton.

Section 8. Comparison of costs of Bessemer rail ingots.

Bessemer rail ingots are practically the same as Bessemer billet ingots, except that the steel is hardened by the use of a larger proportion of manganese, which tends to increase the cost slightly. While all the products considered in this chapter were produced in the same districts, and by the same companies (so far as each produced the products under consideration), a slight variation from this rule is found in the case of Bessemer rail ingots and rails (cf. p. 40), by the inclusion of another company in this case. This does not introduce, however, any disturbing elements of substantial importance.

The following table gives the costs of Bessemer rail ingots both before and after the elimination of antecedent profits from transfers of materials. As all the companies making rail steel were large concerns, only one group is presented in the table.

TABLE 14.—AVERAGE BOOK COST PER GROSS TON OF BESSEMER RAIL INGOTS AND COST EXCLUDING TRANSFER PROFITS, FOR ALL COMPANIES, 1902-1906.

[15,495,210 tons.]

Items of cost.	Book cost.	Excluding transfer profits.
Pig iron and scrap	$14.45	$12.70
Manganese	.80	.73
Fuel	.15	.13
Labor	.55	.55
Other operating	.59	.59
Works cost	16.54	14.70
Additional costs	1.05	1.05
Total cost	17.59	15.75

The only items in the cost of Bessemer rail ingots affected by the elimination of antecedent profits from transfers were pig iron and scrap, manganese, and fuel (cupola coke).

The book cost of pig iron and scrap was $14.45 per ton of ingots, as compared with $12.70 per ton after the elimination of transfer profits. The character of these transfer profits has been already explained above in connection with Bessemer billet ingots (p. 59).

The book cost of the manganese was $0.80 per ton, which was reduced to $0.73 per ton by the elimination of transfer profits. These profits go back to the ore and coke, as already stated (p. 60).

The transfer profits eliminated from the item of fuel relate to coke used in the cupolas; the book cost of fuel was reduced thereby from $0.15 to $0.13 per ton of ingots.

In consequence of these changes in the items of cost, the works cost was reduced from $16.54 per ton, as shown by the books, to $14.70.

The additional costs for Bessemer rail ingots, which averaged $1.05 per ton, consisted of $0.51 for general and miscellaneous expenses and $0.54 for depreciation. They brought the total book cost up to $17.59 per ton; which, after deducting transfer profits, became $15.75 per ton.

These additional costs show probably about a normal figure for depreciation (including cumulative additions for pig iron additional costs), but they are altogether too high for general expenses. A normal figure for the two combined is estimated at $0.60 per ton. This would make the total book cost $17.14, and the same less transfer profits, $15.30.

As stated in previous cases where book costs and these revised costs were compared, the reduction of the book costs by eliminating antecedent profits, while increasing the margin of profit between cost and price, also makes it necessary to take into account the investment in a greater number of stages of production.

Section 9. Comparison of costs of large Bessemer billets.

For the districts which are here under consideration (p. 38), about two-thirds of the output of Bessemer billet ingots was used in making large Bessemer billets. These were the most important single rolled product, not only of Bessemer steel, but of any kind whatever, during the period under consideration. In rolling them from ingots they pass through an intermediate stage in the form of blooms, for which costs are sometimes kept separately. Billets are a semifinished or partly rolled product, which are used either immediately or finally in making a great variety of steel commodities, such as some of the structural material, merchant bar, wire rods, etc. Rails and plates, and to some extent structural material, are not rolled from billets, but either directly from ingots or from blooms (in the case of rails and structural material) or slabs (in the case of plates). In the present cost statements for billets the costs for the blooming mill are combined with the costs for the billet mill, giving the cost of converting ingots into large billets.

The costs of large Bessemer billets both before and after the elimination of antecedent profits from transfers of materials, and distinguishing the costs of large and small companies, are given in the following table:

TABLE 15.—AVERAGE BOOK COST PER GROSS TON OF LARGE BESSEMER BILLETS AND COST EXCLUDING TRANSFER PROFITS, DISTINGUISHING LARGE AND SMALL COMPANIES, 1902-1906.

Items of cost.	All companies (17,151,389 tons).		Large companies (15,722,275 tons).		Small companies (1,429,114 tons).	
	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.
Ingots	$17.67	$15.46	$17.38	$15.05	$20.91	$20.06
Labor	.53	.53	.51	.51	.76	.76
Other operating	.81	.81	.80	.80	.84	.84
Mill cost	19.01	16.80	18.69	16.36	22.51	21.66
Additional costs	1.10	1.10	1.20	1.20	.03	.03
Total cost	20.11	17.90	19.89	17.56	22.54	21.69

COMPARISON OF BOOK COSTS.—Comparison may be made first of the differences between the average book costs for all companies with those for large and small companies. The average mill cost of large Bessemer billets, as shown by the books, was $19.01 per ton for all companies and $18.69 and $22.51, respectively, for the large and small companies. Thus the average mill cost of the large companies was $0.32 per ton lower than the average for all, while the average mill cost for the small companies was $3.50 per ton higher. The much higher mill costs of the small companies were due chiefly to a great difference in the average cost of the ingots used, and also to a small extent to higher labor costs.

The average book cost of ingots used was $17.67 per ton for all companies, compared with $17.38 for the large companies and $20.91 for the small companies. The difference in this item between the large and small companies, namely, $3.53 per ton, corresponds almost exactly to the difference between the works cost of Bessemer billet ingots for the large and the small companies already given (p. 57).

There were also marked differences in labor cost. The average for all companies was $0.53 per ton, as compared with $0.51 for the large companies and $0.76 for the small companies. The chief cause for this difference is probably found in differences in average output per mill, but partly also to differences in labor-saving devices.

Against these lower mill costs, however, the large companies had much higher additional costs, namely, $1.20 for the large companies as compared with $0.03 for the small companies. As already explained (p. 29), most of this additional cost is an accumulation of additional costs in prior stages of production, which does not appear in the cost of the ingots used, because these were generally transferred at works cost. These additional costs were invariably much heavier for the large companies, and, as already explained, were generally unduly high for them, both for general expense and depreciation, while too low for the small companies.

The details of this additional cost were as follows:

Items.	Large companies.	Small companies.
General and miscellaneous expense	$0.61	....
Depreciation	.59	$0.03
Total	1.20	.03

The criticism of these items is in part the reverse of that for the similar items previously considered (p. 59). In this case the depreciation appears too low for the large companies, although the general expense is much too high. For the small companies these charges appear entirely inadequate.

On account of these inequalities in additional costs the differences in total book costs were not so great for the large and small companies as the differences in mill costs.

The average total book cost for all companies was $20.11 per ton of large Bessemer billets, for large companies $19.89, and for small companies $22.54 per ton. The difference in total book cost between the large and small companies, therefore, was $2.65 per ton.

If instead of the above additional costs an assumed normal cost of $1.10 per ton be taken (including cumulative additions for pig iron and ingots), the difference in total book cost between large and small companies would be $3.82.

COMPARISON OF COSTS AFTER ELIMINATION OF INTERMEDIATE TRANSFER PROFITS.—The elimination of antecedent profits from transfers of materials tended to reduce the average costs for all companies, this effect being very pronounced for the large companies and of much less importance for the small companies. The only item of cost which was affected in any case by the revision was that for the ingots used.

The book costs of ingots used for all the companies—$17.67 per ton of billets—was reduced to $15.46 per ton by the deduction of transfer profits. The transfer profits so deducted comprise, of course, all the transfer profits in prior stages of production affecting the cost of this item from the ore, coke, pig iron, ingots, etc.

The average mill costs of large Bessemer billets for all companies were reduced from a book figure of $19.01 per ton to $16.80 by the elimination of these transfer profits. In a similar manner the total book cost was reduced from $20.11 per ton to $17.90. The final differences were exactly the same, of course, as the differences in the cost of ingots used, which are given above. They were naturally a little greater than for the corresponding costs of Bessemer billet ingots, because a little more than 1 ton of ingots is required to make a ton of billets.

As stated in discussing these costs for the preceding products, while the elimination of antecedent profits tends by lowering costs to show a greater margin between costs and prices, it also makes it necessary to compare this greater margin of profit with a greater total investment.

The elimination of antecedent profits affected chiefly the costs of the large companies. The cost of ingots was the only item affected.

For the large companies the elimination of transfer profits reduced the cost of ingots from $17.38 per ton of billets to $15.05, a difference of $2.33 per ton.

The same differences naturally appear in the mill costs in each case, the elimination of transfer profits reducing the original figure of $18.69 to $16.36.

In exactly the same way the total book cost of large companies of $19.89 per ton of billets was reduced to $17.56.

The elimination of transfer profits reduced the cost of ingots for small companies from a book figure of $20.91 per ton of billets to $20.06 per ton, or by $0.85 per ton. A corresponding difference appears for the mill costs as shown on the books ($22.51) and the revised mill costs ($21.66), and likewise between the total book cost ($22.54) and the revised total costs ($21.69).

Comparing the large and small companies, the difference in total cost was $4.13 after eliminating transfer profits.

If, however, instead of taking these additional costs as a basis an assumed normal cost of $1.10 were used, the difference would be $5.30.

Section 10. Comparison of costs of Bessemer rails.

During the period here under consideration, namely, 1902 to 1906, practically the whole rail production of the country was from Bessemer steel. The figures of rail costs which are presented below include the most important and efficient mills which produced Bessemer rails, and, as already shown (p. 38), 77.1 per cent of the total production of the entire country.

The following table gives the book costs of heavy Bessemer rails, and the same costs after the elimination of antecedent transfer profits. As all the companies making heavy Bessemer rails were large companies, only one group is shown in the table.

TABLE 16.—AVERAGE BOOK COST PER GROSS TON OF HEAVY BESSEMER RAILS AND COST EXCLUDING TRANSFER PROFITS, FOR ALL COMPANIES, 1902-1906.

[10,618,799 tons.]

Items of cost	Book cost.	Excluding transfer profits.
Ingots	$17.52	$15.05
Labor	1.16	1.16
Other operating	1.30	1.30
Mill cost	19.98	17.51
Additional costs	1.29	1.29
Total cost	21.27	18.80

The only item of cost affected by the elimination of antecedent profits was that of the ingots used.

The average book cost of ingots used was $17.52 per ton of rails. This was reduced to $15.05 by the elimination of transfer profits, or by $2.47. The transfer profits thus excluded relate in a greater or less degree to all the successive antecedent stages of the business (except the transfer of ingots to the rail mill).

The average mill cost of rails, which on the books stood at $19.98 per ton, was reduced to $17.51.

The mill cost as shown by the cost sheets was increased by the allotted additional expense from the profit and loss statements by $1.29 per ton, of which $0.62 was for general and miscellaneous expenses and $0.67 for depreciation. There is no doubt that in this case this allocation of depreciation charges gives too low a rate for rails (including the cumulative depreciation on account of pig iron and ingots), while the general expenses are probably too high for this product. The total amount is probably a fairly reasonable one. Added to the mill costs, they give $21.27 as the average total book cost, which after the profit eliminations described above was reduced to $18.80.

While the cost of rails is thus greatly reduced, the margin of profit between this cost and the prevailing prices is consequently increased; it must, therefore, be constantly borne in mind that the investment which must be covered by the profit shown is also greatly increased.

Section 11. Summary of total costs on basis of assumed normal charges for additional costs.

In the cost statements in the foregoing chapter (and also in Chap. III), certain inconsistencies in the additional costs have been noted in connection with particular products, which were in part due to the use of an arbitrary rule in allocating the general expense and general depreciation, but also to the fact that there were great differences in the way different companies conducted their business and kept their accounts.

Hence certain assumed normal additional costs were given in each case in order to give what was thought to be a fairer estimate of total cost and also to make a fairer comparison between the total costs of the large and small companies. These assumed normal costs are as follows: Pig iron, $0.50; Bessemer ingots, $0.60; Bessemer billets, $1.10; Bessemer rails, $1.30.

It will be convenient, therefore, to summarize the total costs arrived at, by the use of these assumed additional costs, in a single table. For this purpose it is sufficient to show the furnace, works, or mill costs and the total costs for the products whose costs are discussed in this chapter. These are given in the following table, distinguishing (1) book costs and (2) book costs less transfer profits for each of the groups of companies which have been discussed.

TABLE 17.—TOTAL COSTS PER GROSS TON FOR SPECIFIED PRODUCTS, ARRIVED AT BY ADDING TO THE AVERAGE MILL COSTS, AS SHOWN BY THE COST SHEETS, AN ASSUMED NORMAL CHARGE IN PLACE OF COMPUTED ADDITIONAL COSTS (GENERAL EXPENSE AND DEPRECIATION), AND THE SAME TOTAL COSTS EXCLUDING TRANSFER PROFITS, 1902-1906.

	All companies.		Large companies.		Small companies.	
	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.	Book cost.	Excluding transfer profits.
Bessemer pig iron:						
Furnace cost	$13.13	$11.34	$13.04	$11.11	$14.18	$14.12
Total cost (with assumed addition of $0.50 per ton)	13.63	11.84	13.54	11.61	14.68	14.62
Basic pig iron:						
Furnace cost	12.29	11.30	12.17	11.11	13.81	13.59
Total cost (with assumed addition of $0.50 per ton)	12.79	11.80	12.67	11.61	14.31	14.09
Bessemer billet ingots:						
Works cost	16.64	14.55	16.45	14.28	19.96	19.10
Total cost (with assumed addition of $0.60 per ton)	17.24	15.15	17.05	14.88	20.56	19.70
Bessemer rail ingots:[1]						
Works cost	16.54	14.70	....	....	....	....
Total cost (with assumed addition of $0.60 per ton)	17.14	15.30	....	....	....	....
Large Bessemer billets:						
Mill cost	19.01	16.80	18.69	16.36	22.51	21.66
Total cost (with assumed addition of $1.10 per ton)	20.11	17.90	19.79	17.46	23.61	22.76
Heavy Bessemer rails:[1]						
Mill cost	19.98	17.51	....	....	....	....
Total cost (with assumed addition of $1.30 per ton)	21.28	18.81	....	....	....	....

[1] No small companies.

The general effect, it will be remembered, of substituting these assumed normal charges for general expense and general depreciation ("additional costs") in place of the arbitrary allocations from data shown in profit and loss statements was to reduce the total costs of all products for the average costs of all companies in each instance except billets and rails, and still more so for the group of large companies. On the other hand, this method of fixing these additional costs raised the average total costs of small companies for the same products in every instance (except for rail ingots and rails, for which no small companies had any production).

Section 12. Limitations and interpretation of foregoing cost data.

As previously stated, the elimination of antecedent profits from the costs as shown by the books of the companies could not safely be carried beyond the products discussed above with the data available to the Bureau, particularly because the quality of the steel used for many rolled products was not generally specified.

It might appear, nevertheless, that the foregoing discussion of costs, eliminating transfer profits, in connection with the book costs of other finished steel products would afford a means of roughly estimating the net costs of such other more highly manufactured products, and to a certain extent this is undoubtedly true. For example, the net cost of ingots produced as computed by the Bureau, together with the data as to waste, would afford a means of revising the net cost of ingots used in making structural steel from ingots. To this could be added the costs above materials and any additional costs shown by the books of account. A still simpler and rougher method would be to deduct the difference between net cost and book cost of ingots from the book cost of ingots used. Really a greater difference should be deducted if the ingots used are the same as those for which the production costs are given, on account of the change in the cost of waste. The costs above materials would give all other items of mill cost.

There are two serious objections, however, to such an attempt to estimate net costs for other products. In the first place, the quality of steel used is not always known, and it makes a great difference whether it was Bessemer or basic. Most of the structural steel for which the costs are shown was of Bessemer steel, but the plates were to a large extent of basic open-hearth steel. The greater part of the sheets and almost all the wire rods for which cost data are presented were likewise made from Bessemer steel. Nevertheless, except perhaps for wire rods, there would be a considerable probability of error on this account if net costs were estimated in the manner indicated.

In the second place, the costs of production differed widely between different plants, so that the average production cost for all the concerns producing a certain product would afford no exact indication of the cost of this same product for the particular concerns which furnished the material used for making a given product in a succeeding stage of production. This would be especially true of a product like billets, which may be used for producing wire rods, merchant bars, and other articles. The particular quantities of billets supplied for making wire rods might come from different plants from those used for making merchant bars, and have considerably different costs of production.

For these reasons, as well as other technical difficulties, the Bureau refrained from estimating such costs, and confined its attention to the cost computations given above, which involved the deduction of actual amounts of profit for the several companies whose costs were averaged.

The foregoing statements of costs, including and excluding the antecedent transfer profits, show in a broad way the effect of such profits on the costs of products. They do not show the effect of such profits exactly, because it was not possible to ascertain all such profits, although there is no doubt that the great bulk of such transfer profits was ascertained and eliminated; moreover, from the nature of the transactions and the character of the records kept, no system of distributing such profits can be exact. (See note, p. 122.)

The elimination of the actual antecedent profits for transfers does not give, of course, an ideal or perfect integration cost, even for the large companies, because all the large companies included were not completely or equally integrated. The Steel Corporation was, of course, integrated very thoroughly with respect to all stages of production and manufacturing; but several of the other large companies were not so fully integrated, often being obliged to purchase a part of their materials of production. Hence, the average result for the revised costs, exclusive of transfer profits, is somewhat higher than it would be had the integration been absolutely complete.

Finally, the caution should be reiterated that when these net costs are considered it is absolutely necessary to have regard to the fact that whatever margin of profit may be found between them and the prices of the respective products, this margin of profit must be compared with a larger investment—i. e., furnish the return to investment not only on the immediate stage of production, but also on all anterior stages comprehended, back to and including the production of the raw materials.

Section 13. Effect of Steel Corporation's transportation profits on the cost of its ore.

General character of transportation profits.—The profits which were eliminated from the costs of raw materials and finished products in the foregoing sections related entirely to transfer profits on materials which were included in such costs. It was made clear, however, that in addition to these transfer profits there were transportation profits earned by these concerns which also had an important relation to the net costs of such products. These transportation profits relate to three classes of agencies, namely, railroads, Lake vessels, and docks for the transshipment of ore.

While each of these classes of transportation facilities were possessed by several of the companies whose costs have been averaged, the only company for which they were of any great importance was the Steel Corporation. For the Steel Corporation these transportation agencies were not only of extraordinary importance, but they also yielded to the Corporation in connection with ore traffic a very large profit. As has been shown in Part I of this report, already published, the Steel Corporation owns two railroads operating in the Lake ore mining districts, and particularly in the Mesabi Range, which were of unusual importance for this traffic, namely, the Duluth & Iron Range Railroad, and the Duluth, Missabe & Northern Railway. It also owns the largest fleet of ore-carrying vessels on the Great Lakes, which is operated under the name of the Pittsburgh Steamship Co. At lower Lake ports it owns, besides several important docks serving plants located on the Great Lakes, other docks for transshipping ore destined for points beyond, and in particular the Pittsburgh & Conneaut Dock Co. This dock is operated in connection with the Bessemer & Lake Erie Railroad, which is owned by the Steel Corporation and which furnishes it with the means of transporting its ore from the Great Lakes to the Pittsburgh district. At its terminal in the Pittsburgh district the Bessemer & Lake Erie Railroad connects with a belt line known as the Union Railroad, another subsidiary of the Steel Corporation, which serves the various plants of the Steel Corporation in that district.

The Steel Corporation has other important railway properties used for the transportation of ore, particularly in the Chicago district, where two of its railways, namely, the Chicago, Joliet & Eastern, and the Chicago, Lake Shore & Eastern, connect its ore docks with all of its plants in that locality.

By means of these various transportation facilities the Steel Corporation is enabled to carry the great bulk of its ore from the mines to the manufacturing plants where it is consumed. In the mining region only a small part of its ore, namely, that portion mined on the Old Ranges in Michigan and Wisconsin, is necessarily transported by other railroads. On the Great Lakes, however, the Corporation ships a very considerable part of its total ore—rather more than one-third—by independent Lake carriers. Moreover, inasmuch as south of the Great Lakes a number of its furnaces can not be reached by its own railways, it is obliged to transport a considerable part of its ore shipments on other railway lines.

Certain of these transportation agencies, particularly the two ore roads in the ore-mining region, the Lake ore vessels, the ore docks, and the Bessemer & Lake Erie Railroad, are primarily carriers of ore. The ore tonnage of the Union Railroad is also very heavy. For the other carriers mentioned, however, the transportation of ore is of secondary importance. Consequently it is not practicable to determine with any satisfactory degree of accuracy the profits obtained from the carriage of ore except for those agencies which have just been mentioned.

METHOD OF DETERMINING TRANSPORTATION PROFITS ON ORE FROM GROSS RECEIPTS THEREON.—Where railroads or other carriers handle several commodities, it is of course quite evident that there is generally no possibility of determining with absolute exactness the amount of profit from each. A large part of the costs of the business can not be allocated to particular lines of traffic, and consequently their particular profits can not be determined. Inasmuch as the ore traffic was the chief business of these ore carriers, the Bureau regarded it as reasonable to allot to the ore traffic the same proportions of the total net operating profit as the gross receipts from the ore traffic bore to the gross receipts from all traffic. It is certain that this does not tend to magnify the profit attributable to ore.

Indeed, this method of computation probably underestimates the net profit from ore traffic—first, because the rates and receipts from ore were unusually high, and second, because the direct cost of handling the traffic was relatively low. That the ore rates were high is evidenced by the fact that on the railroads in the ore region they averaged about 1 cent per ton mile during this period.[1] On other railroads they were also relatively high, though not in the same degree. That the direct costs of conducting the ore traffic were low is plain when it is considered that this commodity is generally handled in trainloads.

The same principle would hold true in the case of the Pittsburgh Steamship Co. It was also undoubtedly true of the Bessemer & Lake Erie. In the case of the Union Railroad it is possible that the ore profits were relatively no greater, or possibly not as great, as for the other traffic on that road, which is considerable; but taking the carriers south of the Lakes together there can be no question whatever that the total net profits here assigned the ore understate the facts.

The data for estimating these profits on the basis indicated for the calendar years 1902 to 1906, inclusive, were furnished by the Steel Corporation.

ESTIMATED NET PROFITS OF STEEL CORPORATION ON TRANSPORTATION OF ORE.—The following table shows the gross receipts from all freight traffic and the gross receipts from ore, together with the net operating profit from all traffic, as reported by the Steel Corporation. As already explained, the Bureau's estimate of the net profit from ore is computed on the assumption that it bore the same ratio to the total net operating profits as the gross receipts from ore bore to the gross receipts from all freight traffic.

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[1] These rates have recently been reduced. (See p. 79.)

TABLE 18.—TOTAL ESTIMATED NET PROFITS OF STEEL CORPORATION ON TRANSPORTATION OF ORE (INCLUDING ORE SHIPMENTS OF OUTSIDERS) FROM MINING REGIONS TO FURNACES BY COMPANIES, 1902-1906.

Carriers.	Gross receipts.	Gross receipts from ore.	Total net operating profits.	Estimated net operating profits from ore.[1]
Duluth & Iron Range R. R.	$32,037,940.42	$26,590,173.84	$15,703,239.47	$13,017,515.59
Duluth, Missabe & Northern Ry.	32,104,324.00	28,570,826.98	18,426,574.97	16,417,332.68
Pittsburgh Steamship Co.	41,622,827.98	37,692,370.08	9,743,161.46	9,397,035.62
Bessemer & Lake Erie R. R.	23,661,689.97	14,274,443.61	9,642,528.76	5,834,472.20
Union R. R.	12,681,621.97	6,804,815.97	4,928,873.56	2,646,025.39
Pittsburgh & Conneaut Dock Co., and other docks				[2] 5,571,121.88
Total	142,108,404.34	113,932,630.48	58,444,378.22	52,883,503.36

[1] While these are derived by proportion from the total net operating profit and the gross earnings from ore and total gross earnings, this was worked out, of course, by years and should not be computed from the five-year totals.

[2] Partly estimated from gross receipts and partly reported directly.

The profits of the Steel Corporation from the transportation of ore, in so far as they can be estimated, as shown in the foregoing table, include the profits earned on the ore shipments of outsiders. It is a fair question whether in estimating the net result to the Steel Corporation in respect to its position as a producer of ore and manufacturer of iron and steel products, the full amount of this profit should not be deducted from the cost of its ore. Looking at the problem from a broad standpoint rather than a cost-accounting standpoint, the Bureau is inclined to the opinion that this would be a reasonable and proper method for determining the full and complete net results to the Steel Corporation. However, from a strict cost-accounting point of view, in order to determine the cost of ore at lower Lake ports or other points, it is quite proper to limit the profits to be taken into consideration to those which are earned by the Steel Corporation on the carriage of its own ore. This is the practice of the Steel Corporation in determining its own integration costs (see p. 94), and after discussion of the matter with representatives of the Corporation the Bureau has accepted it for the purpose of the present computation. Hence, from the amount of profit on the transportation of ore shown in the foregoing table, it is necessary to deduct that part of the profit which was earned on the carriage of outside ore. These profits on outside ore are computed as follows:

Duluth & Iron Range R. R.	$4,331,334.87
Duluth, Missabe & Northern Ry.	1,482,129.95
Pittsburgh Steamship Co.	522,871.43
Total	6,336,336.25

The profits of the other transportation agencies noted in the foregoing table are, so far as the Bureau's information goes, earned entirely on the transportation or handling of the Steel Corporation's own ore. Deducting the above profits on outside ore from the total net profits earned by the Steel Corporation on the transportation of ore shown in the above table, gives the profit earned by the Steel Corporation from the carriage of its own ore, which in the aggregate was $46,547,167.11.

The significance of this aggregate profit of the Steel Corporation on the transportation of its own ore with respect to the net cost of ore can be best shown by comparing it with the total deliveries of the Steel Corporation's ore at lower Lake ports during this same period (1902–1906), namely, 77,304,164 tons. Distributed over this tonnage, the foregoing profits amounted to a trifle over $0.60 per ton of ore. Of this, $0.42 was earned on the transportation of ore to lower Lake ports. This amount per ton shows practically what may be deducted from the average cost of ore of the Steel Corporation at lower Lake ports. The total average amount per ton, namely, $0.60, is the deduction to be made from the cost of ore at the blast furnaces in order to determine the total effect of transportation profits on the cost of the Corporation's ore used in making pig iron.

These profits, as already stated, are figured against its total deliveries at lower Lake ports as a convenient common denominator. These deliveries were nearly the same as the furnace consumption. Of course, the actual profit on transportation for a given lot of ore would vary between one specific shipment as compared with another according to its origin and destination. On the other hand, it would make no difference what the quality of the ore was. The fairest way to show the total effect of such profits is in the form stated above.

It should be noted that this average profit is that on the ore of the Steel Corporation alone, and should not, of course, be applied to the average ore costs for the large companies given in section 2 of this chapter.

EFFECT OF THIS TRANSPORTATION PROFIT ON COSTS OF IRON AND STEEL PRODUCTS.—This large profit of the Steel Corporation on the transportation of its own ore is an exceedingly important factor in its net cost of manufacture for iron and steel products, owing to the fact that approximately 1.9 tons of Lake ore, on the average, including both Bessemer and non-Bessemer ores, were, during this period, required to produce 1 ton of pig iron. This ore profit assumes increased importance in the costs for pig iron, and still further importance in the costs of steel products, owing to the fact that in each successive stage there is some further loss of material. It is not intended, however, at this place to take up the relation of this profit to the cost of the iron and steel products of the Steel Corporation for this period (1902–1906). In Chapter VII the "integration" costs of the Corporation for the year 1910—that is, the costs after deducting both the intermediate transfer profits and the Corporation's profit on the transportation of its ore—will be shown according to its own records.

CHAPTER VI.

COMPARISON OF 1902-1906 COSTS WITH PRESENT COSTS.

Section 1. Introductory.

The average costs for 1902 to 1906, as already stated (p. 7), were too elaborate to be brought down to date. Furthermore, it was reasonably certain that an average for such a recent five-year period would be representative of present conditions. There had been no important changes since then in the fundamental conditions of the industry, such as the character of ore and fuel used, and no very marked changes in the operating conditions, such as wages of labor, transportation charges, or technical methods. In fact, in so far as changes had occurred in operating conditions, it was likely that they would to a considerable extent offset each other. Thus an increase in wages would be partly offset by increased volume of output and a greater application of labor-saving devices.

The Bureau did not leave the determination of this question to a priori arguments, however, but obtained considerable information from various companies concerning the actual changes in cost in the principal branches of production and manufacture.

The primary question to be determined was whether there had been any increase in the cost of producing the raw materials, and if this was so whether such increase in cost had been offset by any added economy in converting them into iron and steel. The examination of this subject, therefore, is divided into two parts—(1) the cost of production of ore and coke and limestone and (2) the costs above materials in making pig iron, steel, and some of the chief rolled products.

The costs for 1902 to 1906 will be compared, therefore, with those for the most recent year available, namely, 1910. Certain comparisons, particularly for ore, will combine a greater number of years since 1902 to 1906 to show more clearly the general average conditions in recent years as compared with 1902 to 1906.

Section 2. Comparison of the costs of raw materials.

The costs of ore and coke are, of course, fundamental for the production of pig iron, steel, and steel products. Limestone forms such a comparatively small item of cost and is so abundant in all regions that changes in respect thereto are insignificant. The item of limestone in pig-iron costs can be conveniently covered by a simple comparison of what the pig-iron cost sheets themselves show.

Ore.—The Bureau obtained the book costs of Lake ore at lower Lake ports for all the mines of the Steel Corporation for the whole period 1902 to 1910, inclusive, and also the costs of two other important interests mining Lake ore for the period 1902 to 1909, inclusive. As the tonnage of these two latter companies formed, however, but a small proportion of the total, the lack of them for the year 1910 does not have any material effect on the average cost for the period 1907 to 1910. There is little doubt that if they were included the average cost would tend to be a little lower rather than higher. This is evident from the following facts, namely, that the average for these two concerns in 1909 was $2.61 per ton as against $2.63 per ton for the Steel Corporation, while the latter showed a sudden increase to $2.88 per ton in 1910 due in part to the Hill royalties, which are discussed below (p. 77). This, of course, would not have affected the costs of the other companies. Moreover, its effect on the average for all the companies for the four years 1907 to 1910 was, of course, small.

The following table shows the average book cost of ore for all three companies at lower Lake ports in substantially the same form as that already used, divided into two groups of years, namely, 1902 to 1906, inclusive, and 1907 to 1910, inclusive.

Table 19.—COMPARISON OF AVERAGE BOOK COST PER GROSS TON OF LAKE ORE AT LOWER LAKE PORTS FOR 1902-1906, INCLUSIVE, WITH 1907-1910, INCLUSIVE, FOR THE STEEL CORPORATION AND TWO OTHER LARGE COMPANIES.

Items of cost.	1902–1906 (88,082,551 tons).	1907–1910[1] (88,833,156 tons).	Items of cost.	1902–1906 (88,082,551 tons).	1907–1910[1] (88,833,156 tons).
Labor	$0.43	$0.35	Rail freight	$0.70	$0.74
Other mining	.21	.20	Lake freight	.74	.72
Stripping and development	.03	.11			
Depreciation	.13	.13	Cost at lower Lake ports	2.49	2.54
Royalty	.25	.29	General charges	.09	.16
Cost at mine	1.05	1.08	Total book cost	2.58	2.70

[1] For 1910 includes the costs of the Steel Corporation only.

In the first place, it should be noted that these costs cover a very large quantity of ore, namely, 88,082,551 tons for the five years 1902 to 1906 (an average quantity of 17,616,510 tons per annum), and 88,833,156 tons for the four years 1907 to 1910 (an average quantity of 22,208,289 tons per annum). For the two periods stated they cover 60.8 per cent and 56.3 per cent, respectively, of the total tonnage mined on the Lake Superior ranges.

The total book cost at lower Lake ports, as shown by the combined cost sheets, for the period 1902 to 1906 was $2.58, while for the period 1907 to 1910 it was $2.70 per ton, showing an increase of $0.12 per ton of ore. The direct labor expense in mining showed a decrease from an average of $0.43 per ton for the period 1902 to 1906 to $0.35 for the period 1907 to 1910, a reduction of $0.08 per ton. This was undoubtedly due to two causes—(1) a greater proportion of the production in the second period was from the Mesabi Range, where the labor costs of mining are generally lower, and (2) there were more open-pit mines worked in the second period than in the first, for which mine labor and "other mining" costs average less per ton. The "other mining" items, however, showed a decrease, namely, from $0.21 to $0.20 per ton. The lower labor costs are offset by increased charges for stripping, which, in part, was the cause of such lower costs. This item, so far as ascertainable, is therefore shown separately, although it might be treated as a part of depreciation for improvements. Stripping operations, however, are sometimes charged in the direct mining costs of labor, supplies, etc., about 70 per cent of the cost being for labor. These operations, by enabling the extraction of ore from open pits instead of through shafts, etc., reduce the direct operating expenses. The stripping cost increased from an average of $0.03 per ton for the period 1902 to 1906 to $0.11 per ton for the period 1907 to 1910, an increase of $0.08 per ton. This was practically an offset to the lower labor and "other mining" cost just noted of $0.09 per ton. The increase in stripping is unduly exaggerated in this comparison, however, because in the first years covered by these comparisons, especially 1902, 1903, and 1904, none of the mines showed the costs for this item separately, though they were then relatively small.

The item of depreciation is to some degree arbitrary in amount. It averaged $0.13 per ton for the period 1902 to 1906, and was the same also for the period 1907 to 1910.

The average royalty for the period 1902 to 1906 was $0.25 per ton, as against $0.29 for the period 1907 to 1910, showing an increase of $0.04 per ton. This increase in average royalty was partly due to the inclusion of the abnormally high royalties paid by the Steel Corporation on the "Hill lease," which have been discussed in some detail in Part I of this report. Inasmuch as the Steel Corporation has, since Part I of this report of the Bureau was published, given notice of the cancellation of this lease (to take effect Jan. 1, 1915), these abnormally high royalties will not form a permanent and increasing burden on the ore industry of the Lake region after that date. Indeed, they should not be regarded as a normal increase in the cost of producing ore even at the present time, inasmuch as the purpose of this lease, in the opinion of the Bureau, was to monopolize the ore reserves of the Lake region. The quantitative effect of these Hill royalties is partly indicated in the average royalty cost of the Steel Corporation in 1910. (See p. 95.) If the Hill royalties and the tonnage of ore mined from the Hill leases were eliminated from the Steel Corporation's royalty cost in 1910, the average royalty for that company would have been only $0.28 per ton, instead of $0.34, a difference of $0.06 per ton.

The average cost at mine for the period 1902 to 1906 was $1.05 per ton, and for the period 1907 to 1910 it was $1.08, an increase of $0.03 per ton.

The cost of transporting ore by rail from the mines to upper Lake ports averaged $0.70 per ton for the period 1902 to 1906 and $0.74 for the period 1907 to 1910, an increase of $0.04 per ton. This was not due, however, to any change in freight rates, but to the fact that in the second period a greater proportion of the total tonnage was mined from the Mesabi Range, which has a higher freight rate than the Michigan ranges.

For Lake freights, on the other hand, there was a slight decrease in cost, the average for 1902 to 1906 being $0.74 per ton, as against $0.72 for 1907 to 1910, showing a decline of $0.02 per ton. Lake freights, unlike rail freights, were changed from year to year. In spite of the greater proportion of ore shipped from the Mesabi Range (which has a relatively high Lake freight), the general decline in Lake rates resulted in a small decline in the average Lake freight.

Taken together, the rail and Lake freights for 1907 to 1910 showed a slight increase, namely, $0.02 per ton more than in 1902 to 1906.

The cost at lower Lake ports, exclusive of general administrative charges and taxes, averaged $2.49 for the period 1902 to 1906, as compared with $2.54 per ton for 1907 to 1910, an increase of $0.05 per ton.

There was a marked increase in the general charges for administration, depreciation, and taxes, namely, from an average of $0.09 per ton in the first period as compared with $0.16 in the second period, showing a difference of $0.07 per ton. The greater part of this increase was due to increases in the taxes on ore companies. While the Bureau does not commit itself to the propriety of charging property taxes into the costs of production, it has included them in all the foregoing statements of cost of production, according to a common practice of commercial accounting.

The total book cost at lower Lake ports thus arrived at averaged, as stated above, $2.58 for the period 1902 to 1906 and $2.70 for the period 1907 to 1910, an increase of $0.12 per ton.

These costs are all "book costs," i. e., there has not been any deduction of transportation profits on ore of the Steel Corporation or of the other companies whose costs are combined in this average. If these had been eliminated, there is no question that the integrated cost so arrived at would have been lower for the period 1907 to 1910 than for the period 1902 to 1906. This would be so, because (1) a greater proportion of Mesabi ore was produced in the period 1907 to 1910 than in the prior period, upon the shipments of which the Steel Corporation's transportation profits chiefly accrue, and (2) the rates of profit per ton of ore on the Steel Corporation's two railroads in the ore region were considerably higher in the period 1907 to 1910 than in the prior period, as is plainly indicated by a marked decrease in the average ratio of operating expense to gross receipts for these roads.

Another fact of great importance in considering the present costs of Lake ore, as well as the probable costs for the next few years, as distinguished from the comparison for the two periods covered by the foregoing table, is found in the recent change made in the rail rates on ore from the Mesabi and Vermilion Ranges. During the latter part of 1911 (and since the publication of the first part of this report) the Steel Corporation announced reductions in the rail rates for the Mesabi and Vermilion Ranges as follows: The Mesabi rate was reduced from $0.80 per gross ton to $0.60 per gross ton, and the several Vermilion rates of $0.90 and $1 per gross ton were reduced to a flat rate of $0.60 per gross ton. Just what effect these reductions will have on the cost of ore at lower Lake ports depends, of course, on the particular tonnages shipped from each range. For the mines whose costs for the period 1907 to 1910 are comprised in the foregoing table (Table 19) the reduction in average freight rate would be about $0.17 per ton, and this would result in a reduction in the average cost at lower Lake ports of an equal amount per ton. Taking the average book costs of the period 1907 to 1910 as a basis, the cost of ore at lower Lake ports would be reduced thereby from $2.70 per ton to $2.53, and this ore cost would be $0.05 per ton lower than the average cost for the period 1902 to 1906, namely, $2.58 per ton.

Looking merely at the book cost of Lake ore for the years 1907 to 1910 as compared with that for 1902 to 1906, there would appear, therefore, to be an increase of about $0.12 per ton. Considering, however, the lower ore rates now prevailing, it is clear that the costs of ore at the present time (1912) are probably lower than those in the period 1902 to 1906.

Coke.—For all practical purposes the question whether there has been an increase since 1902 to 1906 in the cost of coke used in making pig iron is determined by a comparison of the costs for Connellsville beehive coke. The data on this point available to the Bureau are less complete than for Lake ore, and consist (1) of average costs for the Steel Corporation's Connellsville coke for the period 1902 to 1906 and for the single year 1910, and (2) of average costs of Connellsville coke for two important independent companies for the periods 1902 to 1906 and 1907 to 1909. The latter may be conveniently taken up first.

The costs for these two independent companies can not be shown by items because in one case the cost was figured with the cost of coal at the ovens, and in the other case was a cost which included an item of freight to ovens in the cost of coal. The significant figures, however, are the total costs of the coke, which for the two companies combined were as follows:

Periods.	Tonnage.	Average cost per net ton.
1902–1906 (5 years)	5,345,280	$2.02
1907–1909 (3 years)	3,049,589	2.11

From this comparison it appears that there was a small increase in the cost of Connellsville beehive coke, namely, $0.09 per net ton. While the production was considerable, it was, of course, only a small part of the total, and can not be regarded as conclusive as to the change in average cost.

The second comparison to be presented is that of the average book cost for the total production of the H. C. Frick Coke Co. for 1902 to 1906, inclusive, with the average book cost for the single year 1910. This is shown in the following table:

TABLE 20.—COMPARISON OF COST PER NET TON OF CONNELLSVILLE BEEHIVE COKE OF THE H. C. FRICK COKE CO. FOR 1902–1906 WITH 1910.

Items of cost.	1902–1906 (43,579,144 tons).	1910 (9,824,446 tons).
Labor	$0.94	$1.07
Other operating[1]	.24	.30
Depreciation	.14	.18
Total	1.32	1.55

[1] Includes materials and supplies, general expense (administration, taxes, and insurance), less credits for profits on tenements, blacksmithing, farms, etc.

According to the foregoing table, there was a marked increase in the cost of producing coke in 1910 as compared with the average of the five years 1902 to 1906, inclusive, namely, $0.23 per net ton.

It is quite probable that if the average for the period 1907 to 1910 was given instead, the increase would have been decidedly less. However, in the absence of definite figures, the Bureau prefers to accept this statement for the purposes of the present comparison. Furthermore, in view of the importance of the Frick company and the immense tonnage it produces, it is disposed to disregard the preceding comparison for the two independent companies whose costs showed a much smaller increase.

LIMESTONE.—The Bureau did not attempt to ascertain the direct costs of production of limestone because this cost was a small item per ton of pig iron and the conditions of the industry were such that it did not seem necessary. For the purpose of determining whether there has been any important change in the cost of the raw material, the pig-iron cost sheets afford sufficiently conclusive evidence.

For such a comparison it is preferable, of course, to compare pig-iron costs which do not show any considerable change in the quantity of ore and coke used per ton of pig iron. A good basis for this is found in the limestone costs for Bessemer pig iron at three large furnace plants of the Steel Corporation for the five-year period 1902 to 1906 and for the year 1910. These are shown in Table 21 (p. 82) in connection with the costs of pig iron. The costs and quantities used per ton of pig iron produced were as follows:

	1902–1906	1910
Limestone cost per ton of pig iron	$0.40	$0.40
Gross tons of limestone used per ton of pig iron	0.447	0.443

The limestone costs were identical per ton of pig iron for the five-year period and for the year 1910. Furthermore, there was substantially no change in the quantity required per ton of pig iron.

It may be concluded, therefore, that neither the cost of production of limestone itself nor the cost of limestone used in the production of Bessemer pig iron has changed in any significant degree.

In the case of basic pig iron, however, it may be that there has been a slight increase in limestone costs per ton of pig iron made, due to lower average iron content of ores used, but the available data do not furnish any reliable evidence on this point.

Section 3. Costs above materials of pig iron, Bessemer steel, and heavy standard rails.

In the preceding section the costs of the raw materials for the period 1902 to 1906 have been compared with the costs for subsequent years, and it has been shown that there was a small increase in the actual costs of raw materials used in making pig iron. Furthermore, it was shown that at the present time (1912) the cost of the most important raw material is probably less rather than greater.

The next question to be determined is whether the costs other than materials, or, as they are usually called, costs above materials, in the manufacture of pig iron, steel, and rolled products have increased or decreased. Obviously, no further attention need be paid to the raw materials when once the general changes in the costs thereof have been ascertained and their cumulative effect in subsequent stages of production computed.

PIG IRON.—The general position of the iron and steel industry of any country or district with respect to the cost of production is practically determined by its cost of pig iron. This assumes, of course, that the manufactures of steel are developed on a large scale, and that the market for products is broad enough to enable a large tonnage to be produced, and so to justify modern equipment and methods.

It has already been shown (p. 21) that the cost of pig iron is chiefly a question of the cost of the raw materials, ore, coke, and limestone, which costs for 1902 to 1906 have already been compared with the costs of subsequent years.

The costs above materials, however, are of considerable importance for this comparison, and these will now be considered.

For the comparison of these costs the principal data relied on by the Bureau are the average costs of Bessemer pig iron for three important plants of the Steel Corporation for the five-year period 1902 to 1906 and for the year 1910. These are shown in the following table:

TABLE 21.—COMPARISON OF BOOK COST PER GROSS TON OF BESSEMER PIG IRON AT THREE FURNACE PLANTS OF THE STEEL CORPORATION FOR 1902-1906 WITH 1910.

Items of cost.	1902–1906 (13,051,404 tons).	1910 (2,668,230 tons).
Net metallic mixture	$7.39	$8.77
Coke	4.05	3.94
Limestone	.40	.40
Labor	.67	.48
Other operating	.73	[1] .43
Furnace cost[2]	13.24	14.02

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[1] The items covered in this figure show a lower aggregate sum in 1910 than for the previous period chiefly on account of credits for gas used in other departments of the works.

[2] This does not include any allowance for "additional costs" shown on profit and loss accounts. (See pp. 10 and 25.)

These three furnace plants together produced 13,051,404 tons of pig iron in the five-year period 1902 to 1906, or an average of 2,610,281 tons per annum, and they produced 2,668,230 tons in 1910. Two of them are among the very best of the Steel Corporation's furnace plants, while the third is probably of somewhat less efficient character.

While all the items of furnace cost are shown in this table, it should be distinctly understood that the comparison which should now be made is simply that for costs above materials, disregarding the "book costs" of the raw materials. The reason for this is evident, namely, that the book costs of the ore (net metallic mixture) and coke are not net costs (i. e., they are costs based on transfer prices, which include profits paid to the Steel Corporation's ore and coke companies), and hence the differences between them do not even tend to show a difference in real net cost.

Consideration is given, therefore, simply to the items of labor cost and "other operating" costs. It appears from the table that for these furnace plants the average cost for labor was $0.67 per ton of Bessemer pig iron for the five-year period 1902 to 1906 and $0.48 for the year 1910, a decline of $0.19 per ton. This marked reduction in cost was probably due to a more effective application of labor-saving methods. The other operating costs averaged $0.73 per ton of pig iron for the five-year period and $0.43 for the year 1910, a decline of $0.30 per ton. The chief cause for this decline was the more extensive utilization of a by-product of the furnace, namely, blast-furnace gas, which, so far as used in steel works, rolling mills, and other producing departments of the same plant, is, of course, credited to the blast-furnace plant. It is true that such deduction for costs of making pig iron were not as carefully kept in the five-year period 1902 to 1906 as in the year 1910, so that the real gain in this respect was less than the cost sheets indicate. On the other hand, the costs above materials for making pig iron into steel and for rolling steel must have been understated in the five-year period in a corresponding degree. As will be shown later, such costs have in fact shown a slight increase for certain products, which are compared, and this increase may be partly explained by this difference in the methods of cost accounting. However, if full credit is to be given for the increase in the latter costs, full credit should also be given for the decrease in pig-iron costs. Hence, it is proper to compare these costs as they are shown in the cost sheets themselves. The total reduction in the "other operating" costs at the blast furnaces was not due solely to this particular credit item for gas, but also in part to other improvements in furnace operation.

The total cost above materials of Bessemer pig iron for these furnaces, therefore, averaged $1.40 per ton for the five-year period 1902 to 1906, as compared with $0.91 for 1910, showing a decline of no less than $0.49 per ton.

In converting the chief raw materials (ore and coke) into pig iron, there were certain changes involved in the cost of these raw materials independent of the cost of producing them. These arose from differences in the average quality used, such as iron content, or from differences in the skill used in combining them (furnace practice).

The net metallic mixture required to produce a ton of Bessemer pig iron averaged 1.84 gross tons for the five-year period 1902 to 1906 and

1.83 gross tons in 1910.[1] Chiefly in consequence of this, perhaps, the quantity of coke required per ton of pig iron produced declined also; it averaged 1.13 net tons for the five-year period 1902 to 1906 and 1.12 net tons for 1910.

Assuming now the average increase in the cost of Lake ore for all companies in the four-year period 1907 to 1910, as compared with the five-year period 1902 to 1906 (see Table 19), as a basis, namely, $0.12 per gross ton, it is evident that inasmuch as about 1.83 gross tons of ore were required per ton of Bessemer pig iron in 1910 (as just shown above), the increase in the cost of this ore per ton of pig iron may be roughly computed at 1.83 times $0.12, or $0.22 per ton.

If, instead of these ore costs for all companies, the average ore costs of the Steel Corporation alone be taken for the same periods as for the pig-iron costs, namely, $2.58 per ton for the five-year period 1902 to 1906 and $2.88 for the year 1910, the difference would be $0.30 per ton, and the increase in ore costs for these furnaces, computed in the same manner, would be $0.55 per ton of pig iron. The average costs of ore for this one year are hardly as representative of the general conditions as those for the average for the four-year period used in the first case.

In the same way, assuming the average increase in the cost of Connellsville coke for the Steel Corporation in 1910, as compared with the five-year period 1902 to 1906 (Table 20) as a basis, namely, $0.23 per net ton, the increase in the cost of coke in Bessemer pig may be computed from the average quantity required. This, as shown above, was 1.12 net tons, which, multiplied by the increase in cost per net ton, gives $0.26 per ton of pig iron.

The costs of limestone, as stated above (p. 81), may be taken at the same figures as shown on the cost sheets (see Table 21), which showed no change for Bessemer pig iron as between the five-year period 1902 to 1906 and the year 1910.

Hence, to determine whether there has been any increase in the net costs of producing Bessemer pig iron the increases in the costs of ore and coke may be compared with the decreases in the costs above materials. The results are shown as follows:

Ore cost, increase	$0.22
Coke cost, increase	.26
Total, increase	.48
Cost above materials, decrease	.49
Net decrease (per ton of pig iron)	.01

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[1] The net metallic mixture used by these furnaces thus showed a slight improvement in iron yield and it should be noted that a slightly greater yield is shown for all Bessemer furnaces of the Steel Corporation in 1910.

If, however, the increase in ore costs in 1910 were taken at $0.55 per ton instead of $0.22, as shown above, there would have been a net increase of $0.32 per ton of pig iron.

As already stated, however, the Bureau regards the first result, namely, a decrease in cost of $0.01 per ton of Bessemer pig iron, as more correctly representative of recent conditions.

When, moreover, present conditions (1912) are considered, there is no doubt that the costs of Lake ore are lower rather than higher, for the reasons already given in detail (p. 79), namely, lower ore rates on the railroads serving the Mesabi and Vermilion Ranges. The present cost of ore being lower, there is no question that the present cost of making pig iron is somewhat lower than in the period 1902 to 1906.[1]

BESSEMER INGOTS.—The cost of Bessemer steel manufacture is just the same for Bessemer billet ingots and for Bessemer rail ingots except for the extra cost of manganese. This is true at least if the same works are operated in the same way, with respect to the use of direct metal. The difference in cost of manganese is of no consequence in this case, because only costs above materials are especially under consideration.[2]

BESSEMER BILLET INGOTS.—While much more Bessemer billet steel is produced by the Steel Corporation than Bessemer rail steel, the available data for comparison are in this case the costs for one plant only, namely, the average works costs as shown by the books for the five-year period 1902 to 1906 and for the year 1910.

TABLE 22.—COMPARISON OF BOOK COST PER GROSS TON OF BESSEMER BILLET INGOTS AT ONE PLANT OF THE STEEL CORPORATION FOR 1902–1906 WITH 1910.

Items of cost.	1902–1906 (2,737,387 tons).	1910 (590,503 tons).
Pig iron and scrap[3]	$15.46	$14.84
Labor	.62	.54
Fuel	.33	.18
Other operating	.65	.65
Works cost[4]	17.06	16.21

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[1] While the Bureau had certain other comparative data which threw some light on the changes in cost above materials of pig iron, none of them was satisfactory, either on account of greatly varying tonnages or mixture of basic and Bessemer pig iron.

[2] The available evidence does not show any increase in the average cost of manganese for the plants of the Steel Corporation.

[3] Including manganese.

[4] This does not include any allowance for "additional cost" shown on profit and loss accounts. (See pp. 10 and 25.)

As stated above (see p. 82), no attention need be paid in this comparison to the cost of pig iron and scrap (including manganese), because the comparison to be made is simply between the "cost above materials."

This cost above materials is summarized in the items of labor, fuel, and other operating. The average labor cost for the five-year period was $0.62 per ton of ingots as compared with $0.54 for 1910, a reduction of $0.08 per ton. The fuel cost showed an even greater reduction, namely, from $0.33 to $0.18, or $0.15 per ton of ingots.

This large reduction in fuel cost was evidently due to a great change in economy of production obtained by using much larger proportions of molten pig iron direct from the blast furnaces. There was no change in the "other operating" costs, which averaged exactly $0.65 per ton of ingots in each case. Comparing the "cost above materials," that for 1902 to 1906 averaged $1.60 per ton of ingots and that for 1910 only $1.37, a reduction of no less than $0.23 per ton.

In the foregoing comparison of the changes in the cost of making Bessemer pig iron for these same two periods (p. 84) the general conclusion was that there was probably a very small decrease—$0.01 per ton—but if the average ore costs of the Steel Corporation for the year 1910 alone were taken, there would be an increase of $0.32 per ton.

In making the Bessemer billet ingots in 1910 comprised in the above table the net quantity of pig iron and scrap used was 1.08 tons per ton of product. Hence, according as the cost of Bessemer pig iron is assumed to have decreased in 1910 as compared with the five-year period (1902–1906) by 1 cent per ton or increased by $0.32 per ton, the net change in cost on this account would be 1 cent decrease or $0.35 increase per ton of ingots, respectively.

Allowing next for the indicated reduction in "cost above materials" shown above, namely, $0.23 per ton, the total change in the cost of making Bessemer billet ingots for these two periods might be computed to be either a decrease of $0.24 per ton or an increase of $0.12 per ton.

These computations refer, of course, only to the change in cost between this five-year period and the year 1910. Taking into account the present position (1912) of the industry, i. e., the lower cost of ore at lower Lake ports on account of reductions in ore freights, there is no doubt that the net cost of making Bessemer billet ingots is distinctly lower than in 1910, and also somewhat lower than for the five-year period 1902 to 1906.

Bessemer rail ingots.—For the comparison of the costs of Bessemer rail ingots the following table gives the book costs at two of the largest Bessemer rail plants of the Steel Corporation for the five-year period 1902 to 1906 and the year 1910.

TABLE 23.—COMPARISON OF BOOK COST PER GROSS TON OF BESSEMER RAIL INGOTS AT TWO PLANTS OF THE STEEL CORPORATION FOR 1902–1906 WITH 1910.

Items of cost.	1902–1906 (8,516,925 tons).	1910 (1,399,127 tons).
Pig iron and scrap[1]	$14.86	$15.67
Labor	.49	.52
Fuel	.10	.10
Other operating	.47	.56
Works cost[2]	15.92	16.85

[1] Including manganese.

[2] This does not include any allowance for "additional costs" shown on profit and loss accounts. (See pp. 10 and 25.)

As already explained (see p. 82), the cost of the pig iron and scrap (including manganese) is of little interest in the present comparison, which is directed simply at the cost above materials.

This cost is summarized in items of labor, fuel, and other operating. The average labor cost for the five-year period 1902 to 1906 was $0.49 per ton of ingots produced as against $0.52 for the year 1910, an increase of $0.03 per ton. There was no difference in the average cost of fuel. For the various other operating expenses the average cost in the five-year period was $0.47 per ton, as compared with $0.56 in 1910, an increase of $0.09 per ton. The total cost above materials was $1.06 for the five-year period 1902 to 1906 and $1.18 for 1910. The total increase in this cost, therefore, was $0.12 per ton.

With this slight increase in the cost above materials of Bessemer rail ingots should be considered the net change in the cost of making Bessemer pig iron, which has already been discussed. The general conclusion arrived at there was that for the two periods here compared there was probably a trifling decrease in the cost of Bessemer pig iron ($0.01 per ton), although taking the Steel Corporation's average ore costs for the year 1910 as a basis, an increase of $0.32 might be figured.

For the particular Bessemer ingots here under consideration the net quantity of pig iron and scrap required to produce a ton of ingots was 1.06 tons in 1910. According as the changes in pig-iron costs are taken as $0.01 decrease or $0.32 increase, the change on account of this item would be $0.01 decrease or $0.34 increase per ton of ingots.

Adding to these last two results the increase in cost above materials of these ingots, namely, $0.12 per ton, would give the total change in cost of production as $0.11 per ton increase or $0.46 per ton increase, respectively.

These computations relate, of course, simply to the above comparison, which is between the five-year period 1902 to 1906 and the year

1910. As already stated (p. 85), however, the present (1912) net cost of production of pig iron is undoubtedly distinctly lower than in 1910. Hence, there is no doubt that the net cost of producing Bessemer ingots is somewhat lower now than for the five-year period 1902 to 1906.

HEAVY STANDARD RAILS.—The most important single finished product of the rolling mill is rails. The cost of rolling them (as distinguished from the material used) does not depend, of course, upon the quality of the steel, but (volume of tonnage being the same) upon the weight per unit of length and the section. The most important kind of rails are heavy standard or T rails, used for steam railways.

A comparison of the cost above materials of heavy standard rails at two of the largest rail plants of the Steel Corporation for the five-year period 1902 to 1906 with the year 1910 is shown in the following table:

TABLE 24.—COMPARISON OF BOOK COST PER GROSS TON OF HEAVY BESSEMER RAILS AT TWO PLANTS OF THE STEEL CORPORATION FOR 1902-1906 WITH 1910.

Items of cost.	1902–1906 (5,944,409 tons).	1910 (923,651 tons).
Ingots	$16.94	$17.86
Labor	1.01	1.14
Fuel	.10	.17
Other operating	.94	1.06
Works cost[1]	18.90	20.23

[1] This does not include any allowance for "additional costs" shown on profit and loss accounts. (See pp. 10 and 31.)

As repeatedly explained (see p. 87), no attention is paid here to the book cost of the ingots used, inasmuch as the question is simply one of differences in cost above materials.

This cost is shown in the items of labor, fuel, and other operating expenses. The average labor cost for the five-year period 1902 to 1906 was $1.01 per ton of rails, as compared with $1.14 for 1910, an increase of $0.13 per ton. The cost of fuel showed an increase from $0.10 for the five-year period to $0.17 for the year 1910, or $0.07 per ton. Other operating expenses increased also, namely, from $0.94 for the five-year period to $1.06 for the year 1910, or $0.12 per ton. The total cost above materials increased, therefore, from $2.05 per ton to $2.37, an increase of $0.32 per ton of rails.

This higher cost above materials for rails is partly due, at least, to the fact that more care is taken in making them in accordance with the recent changes in contract specifications for rails, involving slower "breaking down" of the ingot in the blooming mill, increased cropping of the blooms, and increased care in finishing and inspecting. The increase in cost for these reasons corresponds to an improvement in quality, and, if it could be accurately determined, might fairly be taken account of in the increase in cost above materials.

Considering now the net cost of the raw material, reference is made to the statements regarding the change in cost of ingots in 1910 as compared with the five-year period 1902 to 1906 (see p. 87), namely, an increase of $0.11 per ton or of $0.46 per ton, according to the average ore cost used (pp. 84 and 85).

The net quantity of steel used for the rail plants here under consideration was 1.02 tons per ton of rails produced. Applying this factor to the increases, respectively, mentioned above, the increase for computed cost of material in rails are, respectively, $0.11 and $0.47.

Combining these results with the increase in cost above materials shown above, namely, $0.32 per ton, gives a net increase in each case, namely, $0.43 and $0.79 per ton of rails. So far as these data are typical, therefore, the computation of net cost shows a comparatively small increase in the cost of rails in 1910 as compared with the five-year period 1902 to 1906.

As repeatedly noted (see p. 79), however, there is no doubt that the cost of ore at the present day (1912) is distinctly lower than in 1910, and hence the costs of pig iron, Bessemer steel, and rails are undoubtedly somewhat lower also than they were in the five-year period 1902 to 1906.

OTHER ROLLED PRODUCTS.—If the net cost of Bessemer rails is lower to-day than in the five-year period 1902 to 1906, there is no doubt that the same is true of billets and probably also of other heavy rolled products made from Bessemer steel. As for the lighter rolled products, the Bureau has no satisfactory data, but if there has been a general increase in costs above materials for all rolled products it is quite likely that for some of them, especially those requiring much labor, there has been and is to-day a distinct increase over the average for 1902 to 1906. For some of the lighter rolled products there have been technical improvements and labor-saving devices of sufficient importance to counteract any tendency to increase which may have existed for certain items of conversion expense.

CHAPTER VII.

COSTS OF THE STEEL CORPORATION IN 1910.

Section 1. Distinction between Steel Corporation's book costs and integration costs.

This chapter of the report deals with costs of the Steel Corporation alone for the year 1910, for the chief raw materials, and for typical finished products.

As already shown (p. 8), the unique character of the Steel Corporation and its dominating position in the industry make the subject of its costs of production a matter of public concern.

All the considerations noted in preceding chapters as to the necessity for revision of costs, owing to the effect of legal organization, intercompany transactions, arbitrary transfer prices, etc., apply with especial force in the case of the Steel Corporation, which is a holding company with a large number of constituent and subsidiary companies, and which, moreover, is the only steel-making concern with extensive railroad properties.

The industrial activity of the Steel Corporation covers not only the mining of iron ore and of coal and the making of coke, but also the transporting of ore by both rail and Lake, while its iron and steel manufacturing enterprises cover the making of pig iron, steel, and most of the various lines of rolled products, besides some more elaborated commodities, such as tin plate, manufactures of wire, etc.

As to organization, its ore business is conducted by a distinct company, and likewise the business of its several railroads, its ore fleet, and its several coal and coke producing enterprises, while its iron and steel manufacturing business is divided up among numerous companies, most of which are severally engaged in the production of iron, steel, and numerous finished products of steel.

These several companies have an independent legal existence, and are held together as an industrial unit through the ownership of their stock by the Steel Corporation, which is simply a holding company. The natural consequence of this independent existence of these several producing, transporting, and manufacturing companies is that each one of them has, and necessarily must have, its own separate financial accounts, cost accounts, etc., and these accounts, at least in most cases, have had a continuous existence from a time prior to the formation of the Steel Corporation. Even where prior to the organization of the Steel Corporation these manufacturing companies controlled ore-mining property and indirectly were engaged in the production of ore, this was always done, at least for the districts using Lake ore, through a separate company. Thus, the consolidation of the various ore companies controlled by the Steel Corporation under a central direction, as at the present time, produced no change in the manner of accounting.

Owing in part to this legal organization and in part to a more or less natural separation of ore mining, ore transportation, and coal and coke production from the making of iron and steel products, the costs of production in these several branches were formerly and are still generally treated as independent operations. The cost of a product is always considered by the Corporation as the cost of the product to the subsidiary company which makes it, and if this company has to pay a price which includes a profit on the ore it purchases from another subcompany, or on the coke, such price is regarded, and for the financial accounts of the subcompany in question must be regarded, as a cost to that company.

While this is the natural basis for cost accounts for the several constituent companies, it is important to bear in mind that these various constituent companies, whether engaged in ore mining, ore transportation, coal mining, coke making, or the manufacture of iron and steel products, are in fact combined into a single industrial and commercial unit, though by more or less artificial legal arrangements, under a central control with respect to every branch thereof, and that the divisible profits from each of these companies flow or can be directed, if need be, into a single treasury, namely, that of the Steel Corporation.

Now, just as the Steel Corporation in its combined statements of earnings finds it important to distinguish between profits finally realized by sales to outsiders and profits resulting from intercompany sales between its subcompanies (see Part I, pp. 332–344), so in its cost accounting it is important for a full understanding of its position as a producer to know the cost of its products without the inclusion of the profits on materials or transportation services sold by one subcompany to another. For this reason the Steel Corporation keeps a record of such intercompany profits with respect to materials transferred or transportation services rendered in such a manner as to enable it to determine, at least with approximate accuracy, what the cost would be if no such intermediate profits were charged into costs. Thus, for iron ore used in making pig iron the profit on ore transportation, whether by rail or Lake, as near as it can be determined, together with profits accruing from ore docks, besides, of course, the profit on the sale of the ore (i. e., the difference between its cost and price received by the ore company), is duly computed and credited to the item of ore or metallic mixture in the pig-iron cost sheet. The same principle applies to the coke used in making pig iron. These comprise the only important items of intercompany profit that have relation to the costs of pig iron. The subtraction of these items of profit for ore, coke, etc., provides the Corporation with a means of revising the pig-iron cost as shown by the producing company's accounts. The cost thus arrived at may be regarded as a statistical or "integration" cost; that is, a cost which differs from the cost as shown by the books of account of the producing subcompany. It may be correctly called a statistical or integration cost, inasmuch as it relates to the organization as a highly integrated industrial unit and does not correspond, of course, with the books of account of the several producing companies.

It should be reiterated that it is desirable to have the costs stated in this manner because the inclusion of intercompany profits involves, from a statistical point of view, an inconsistent treatment of several stages of production, inasmuch as such profits are not charged or included on the basis of any economic principle, but simply on the basis of legal organization of companies. Furthermore, if at any particular stage of production, as for example ore mining or ore transportation, the profits charged were unreasonably high, such charges would be incorporated in all subsequent costs and enhance them unduly.

In comparing the book costs and the statistical or integration costs as described above, it is of vital importance to discriminate as to the respective margins between these two costs and the selling price in every instance, inasmuch as the margin in the first case constitutes a return to quite a different investment as compared with the second. Take, for example, the book cost of pig iron, which may be assumed at $14 per ton, and the selling price at $16 per ton. The margin here is $2 per ton, and this represents a profit for the investment and risk in the operation of blast-furnace plant only. For this same pig iron the integration cost may be assumed to be $10.50 per ton, which at the same market price leaves a margin or profit of $5.50 per ton, but the total amount of profit corresponding to this margin constitutes the return on the investment, operation, and risk, not only for the blast-furnace plant, but also on ore mines, ore railroads, ore fleets, and docks, besides coal mines and coke works. A much larger return is requisite, obviously, in the second case than in the first, inasmuch as the profit—i. e., the margin between cost and price—must afford a return to more extensive operations, and consequently to a very much larger investment.

The question as to what constitutes a fair return to the capital invested in the case of the above illustration, or under the actual circumstances about to be presented, can not be discussed at this point, but must depend on a careful consideration of the investment and operations in each department of the business and the attendant risks.

Section 2. Character of antecedent profits eliminated from the Steel Corporation's book costs.

Although the Steel Corporation possesses extraordinarily complete records of its business and profits, even it can not figure with absolute precision the exact amount of antecedent transfer profit which is contained in the book cost or company cost of a particular product at a particular plant. Nor can such a calculation be absolutely precise in the case of transportation profits, because with respect to such profits any rule for allocating the total net operating profits to a particular commodity transported must be more or less arbitrary, however reasonable or proper such rule may be. (See p. 72.)

Furthermore, the computations of the Steel Corporation with respect to antecedent transfer profits included in book costs are not absolutely complete. In such a complicated business as that conducted by this great concern there are a great many possible ways for some insignificant items of profit to get into the cost of supplies, repairs, etc., quite apart from the main sources of such profit, namely, the transfer and transportation profits on the chief raw material of pig-iron manufacture, ore, and the transfer profits on coal and coke and on pig iron and manufactures of iron and steel (which are occasionally charged as they pass from one subcompany to another) in succeeding stages of manufacture. Nevertheless, the Steel Corporation does trace out and include such antecedent transfer profit with extraordinary care. In the detailed statements of integration profit, particular items of such profit as small as one-tenth of 1 cent per ton are sometimes shown against minor items of cost.

As already pointed out (see pp. 70–71), the great bulk of the Steel Corporation's transportation profit on ore is derived from (1) the transportation over the Duluth & Iron Range Railroad and the Duluth, Missabe & Northern Railway, from the mining region to the head of the Lakes; (2) over the vessels of the Pittsburgh Steamship Co., from the head of the Lakes to lower Lake ports; (3) from certain docks at lower Lake ports; and (4) over certain railroads running from the Great Lakes to furnaces south thereof, and particularly the Bessemer & Lake Erie Railroad, connecting Conneaut with the Pittsburgh district, and the Union Railroad. In the computations of such transportation profit made by the Bureau, these were the only transportation agencies for which any determination of the profit was attempted. The Steel Corporation, however, is able to take account of certain other transportation profits. Furthermore, the extensive records at the disposal of the Steel Corporation make it possible for the Corporation to determine the transportation profits to be eliminated with greater completeness and accuracy than was possible for the Bureau. However, the results obtained by the Bureau's method and those obtained by the Steel Corporation are very close to each other.

While, therefore, the Steel Corporation's computations of the profits of integration included in book cost are not absolutely complete or precise, they are made with unusual care and accuracy. Moreover, there would be no practical advantage even to the Corporation in making such computations absolutely precise, and as the possible differences in cost depending on such precision would be very small they would be also of little public interest.

Section 3. Steel Corporation's integration cost of Lake Superior ore for 1910.

The total production of Lake Superior ore in 1910 is officially reported at 46,328,743 tons, and the total shipments from the upper Lake ports at 43,442,397 tons. The production of Lake ore by the Steel Corporation in 1910 was 23,010,216 tons, or 49.7 per cent of the total, and its shipments from upper Lake ports were 21,546,824 tons, or 49.6 per cent of the total.[1]

Of the total production of the Mesabi Range, which has by far the largest output, and also the lowest costs, and which consequently is of dominating importance, the Steel Corporation produced no less than 58.5 per cent in 1910. For all the other ranges combined ("Old Ranges") the Steel Corporation's production in 1910 was 32.6 per cent.

The costs of Lake ore, as has already been shown above (pp. 16 and 46), are usually stated at lower Lake ports, where the ore is generally sold, and include, therefore, important items of freight for both rail and Lake transportation. The Steel Corporation's position as one of the principal ore carriers both by rail and Lake has already been stated (pp. 70–74), with the Bureau's computation of the total amount of these profits as well as the average rate of profit per ton of total deliveries at lower Lake ports. In its computations of the statistical or integration cost of its ore at lower Lake ports, the Steel Corporation does not, as already stated, take any account at all of the profits which it receives from the transportation of ore for other concerns.

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[1] The total production of Lake ore and the production of the Steel Corporation, by ranges, for the year 1910 are shown in the following table:

Ranges.	Production of Steel Corporation.		Total production.
	Gross tons.	*Per cent.*	*Gross tons.*
Mesabi	17,875,059	58.5	30,576,409
Vermilion	1,338,110	96.2	1,390,360
Gogebic	1,817,598	38.3	4,746,818
Marquette	792,539	17.1	4,631,427
Menominee	1,186,910	23.8	4,983,729
Total Old Ranges	5,135,157	32.6	15,752,334
Grand total	23,010,216	49.7	46,328,743

AVERAGES FOR CORPORATION'S TOTAL LAKE-ORE PRODUCTION.—The following table for the cost of the Steel Corporation's ore at lower Lake ports in 1910 is shown in the same summary form as used in previous statements of book cost (pp. 16 and 46), with two additional columns showing, respectively, the items of transportation profit eliminated and the resultant integration cost:

TABLE 25.—STEEL CORPORATION'S BOOK COST PER GROSS TON OF LAKE ORE AT LOWER LAKE PORTS, AS SHOWN BY PRODUCING SUBCOMPANIES' COST STATEMENTS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND NET INTEGRATION COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

[23,010,216 tons.]

Items.	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).
Labor	$0.35		$0.35
Other operating	.52		.52
Royalty	.34	(1)	.34
Mine cost	1.21		1.21
Rail freight	.74	$0.34	.40
Lake freight	.75	.14	.61
Total lower Lake ports	2.70	.48	2.22
General charges	.18		.18
Total	2.88	.48	2.40

[1] Intercompany royalty $0.002.

The average cost of Lake ore at lower Lake ports, as shown by the ore company's books, was $2.88 per ton. This cost includes, as shown in the second column of the table, items of intercompany profit aggregating $0.48 per ton, which went to the railroad and vessel companies transporting the ore. The actual amounts of profit corresponding to these profits per ton constituted, so far as this part of the ore traffic is concerned, the total return to the investment in such transportation agencies.

The chief part of this intercompany profit is found in the profits from rail freights. These profits average $0.34 per ton in a total average freight charge of $0.74 per ton. The net cost of the rail freight averaged, therefore, only $0.40 per ton. This is the average profit based on the total ore shipments of the Corporation from the Lake region. On that part of the tonnage hauled by the railroads of the Steel Corporation the average was, of course, much higher because out of the total tonnage shipped probably not more than three-fifths was hauled by the Steel Corporation's railroads. On its own ore, hauled by its own railroads, the Steel Corporation's railroad profit was probably about $0.45 per ton. (See p. 97.)

Effective November 30, 1911, the Steel Corporation's subsidiary railroads in the Mesabi and Vermilion districts reduced the long established rates by 20 cents per gross ton on the ore from the Mesabi Range, and from 30 to 40 cents per gross ton on the ore from the Vermilion Range. This, of course, will have a decided effect in reducing the book cost of ore at lower Lake ports, but has no effect on the integration cost computed in the above manner.

The average profit from Lake transportation was much smaller, namely, only $0.14 per ton in an average cost of $0.75 per ton. The net cost for Lake freight, therefore, averaged $0.61 per ton. If the Steel Corporation had carried all of its own ore, the rate of profit per ton probably would have averaged considerably higher. The proportion of its ore shipments by boats of other carriers in 1910 was a little over one-third of its total shipments.

The average cost of transporting the ore from the mines to lower Lake ports was thus reduced from $1.49 per ton to only $1.01 per ton. The resulting profit of $0.48 per ton constituted the entire return from this part of the ore traffic on the investment in the railroads and Lake vessels, which traffic was, of course, the chief part of their transportation business. However, this, as shown elsewhere, was a very large and indeed unreasonable profit. (See p. 72.)

No other items of book ore cost were affected by intercompany profits except royalties. The intercompany royalties were, however, too small to affect the average cost as stated in cents per ton. In this connection it may be noted that the average royalty cost shown in the table, namely, $0.34 per ton, was high on account of the payment of abnormally large royalties on the ore mined under the "Hill" lease. Eliminating both the production and royalty from that lease, the average royalty was only $0.28 per ton. Inasmuch as this lease has been canceled by the Steel Corporation (to take effect Jan. 1, 1915), it is evident that these abnormally high charges are not to be regarded as a permanent factor in the Corporation's ore costs.

The company or book cost of Lake ore at lower Lake ports was thus reduced from an average of $2.88 per ton to only $2.40 per ton, this being, as already noted, a cost which does not include any return to investment in the agencies of ore transportation, in so far as this part of the traffic was concerned.

Comparison of costs for Mesabi and Vermilion Ranges.—The preceding table shows the book costs less transportation profits for all the production of Lake ore of the Steel Corporation in 1910. Inasmuch as its chief ore production was from the Mesabi Range (see p. 94), while its railroads operated only in the Mesabi and Vermilion Ranges, the costs for the ore of the Steel Corporation for these two ranges are shown in the following table in the same manner.[1]

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[1] For the other ranges practically the only item of profit to be deducted is that from Lake freights, which is the same for the Gogebic as for the Mesabi and Vermilion, and from 2 to 3 cents lower for the other two ranges, on account of lower Lake freight rates from those ranges.

TABLE 26.—STEEL CORPORATION'S BOOK COST PER GROSS TON OF ORE FROM THE MESABI AND VERMILION RANGES, AT LOWER LAKE PORTS, AS SHOWN BY PRODUCING SUBCOMPANIES' COST SHEETS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND NET INTEGRATION COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

Items.	Mesabi Range (17,875,059 tons).			Vermilion Range (1,338,110 tons).		
	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).
Labor	$0.21		$0.21	$0.57		$0.57
Other operating	.50		.50	.49		.49
Royalty	.34		.34	.39		.39
Mine cost	1.05		1.05	1.45		1.45
Rail freight	.80	$0.39	.41	.99	$0.52	.47
Lake freight	.76	.14	.62	.76	.14	.62
Total lower Lake ports	2.61	.53	2.08	3.20	.66	2.54
General charges	.18		.18	.17		.17
Total	2.79	.53	2.26	3.37	.66	2.71

This table is of particular interest as showing the situation with respect to the cost of production on the chief range of the Lake Superior district (the Mesabi), which is particularly low, and also because the profits earned from transportation by the Steel Corporation are more clearly brought out by taking the particular ranges in which their railroads operate. Of the Corporation's ore production in 1910, 77.7 per cent was from the Mesabi Range.

The low costs of the Mesabi Range are due chiefly to the low mine costs, its total transportation charges being a little over the average. (See also p. 16.) The mine cost for the Mesabi Range was $1.05 per ton in 1910, of which only $0.21 was for direct mining labor. The Vermilion Range, on the other hand, showed an average mine cost of $1.45 per ton, which included a direct labor cost of $0.57 per ton. Its freight charges were even higher than for the Mesabi Range, and its total book cost the highest for any range.

The items of profit included in these book costs for the Mesabi and Vermilion Ranges (except insignificant items of intercompany royalty) were entirely for rail and Lake freight. The average rail freight for the Mesabi Range was $0.80 per ton, and the average freight profit on the total shipments $0.39. This average freight profit is, of course, considerably lower than it would be if all the ore went over the lines of the Steel Corporation. A considerable portion is hauled by the Great Northern. If the profit earned by the Steel Corporation's railroads were averaged over the ore carried by those roads only, the average profit would be approximately $0.45 per ton instead of $0.39 per ton. However, this average transportation profit of $0.39 per ton for the ore shipped from the Mesabi Range had the effect of reducing its net rail freight cost from $0.80 to $0.41 per ton.

The rail freight from the Vermilion Range averaged $0.99 per ton, and the average transportation profit was $0.52 per ton. The ore shipped from this range was handled by the Steel Corporation's railroad (Duluth & Iron Range) exclusively. Deducting the average profit from the average freight charge gives a net cost for rail freight of $0.47 per ton for the ore from the Vermilion Range.

Both the Mesabi and Vermilion Ranges ship their ore to ports at the head of Lake Superior, which all have the same rate to lower Lake ports. Consequently, their Lake freight charges average the same ($0.76 per ton), and also the profits from Lake transportation ($0.14 per ton). The net cost of Lake freight for the ore of these two ranges, therefore, was identical, namely, $0.62 per ton.

Deducting the items of transportation profit from the book cost at lower Lake ports for Mesabi ore ($2.79) gives the net cost of only $2.26 per ton, which is the lowest net cost for any of the ranges.

Deducting in like manner the items of transportation profit from the book cost at lower Lake ports for Vermilion ore ($3.37) gives a net cost of $2.71 per ton, which is the next lowest net cost for any of the ranges.

As repeatedly stated above, it should be remembered that these integrated costs, to the extent that they take out all transportation profit, include no return to the investment in these transportation agencies in so far as they are used for this part of the ore traffic.

Section 4. Steel Corporation's costs of coke for 1910.

The great bulk of the coke of the Steel Corporation is produced in the Connellsville district in beehive ovens, but there are two important subcompanies which make by-product coke. It is only in the case of the by-product coke costs that intermediate profits appear.

Beehive coke.—The beehive coke of the Steel Corporation in 1910 was produced by three companies, two in the Connellsville district, namely, the H. C. Frick Coke Co., and the Hostetter Connellsville Coke Co., and one in the Pocahontas district, the United States Coal & Coke Co. Although the method of cost keeping practiced by these companies did not involve the inclusion of any integration profits, their costs are of importance, and are summarized in the following table.

TABLE 27.—STEEL CORPORATION'S AVERAGE COST PER NET TON OF BEEHIVE COKE IN THE CONNELLSVILLE AND POCAHONTAS DISTRICTS, AS SHOWN BY PRODUCING COMPANIES' COST SHEETS (WHICH DO NOT INCLUDE ANY INTERCOMPANY PROFIT), FOR 1910.

Items.	Connellsville district: H. C. Frick Coke Co. and Hostetter Connellsville Coke Co. (10,241,971 tons).	Pocahontas district: U. S. Coal & Coke Co. (633,680 tons).
Labor	$1.07	$1.06
Other operating	[1].28	[2].40
Depreciation and royalty	.19	.19
Total	1.54	1.65

[1] Includes credits $0.07.

[2] Includes credits $0.08.

The production of the Frick company was so large in comparison with the other two that an average of the total production is very nearly the same as the costs for the Frick company. The cost of labor ($1.07), which includes the cost of labor in mining the coal used, was by far the most important item of coke cost. The "other operating" costs include a great variety of mining and coking expense, besides certain credits to cost, the most important class of which is the rents from dwellings. The Connellsville coking coal is chiefly owned in fee, so that most of the item "depreciation and royalty" for that district is for extinguishment of the coal. In the Pocahontas district, however, royalty constitutes the main part of this item. The total book cost of coke per net ton was $1.54 for the Connellsville district and $1.65 for the Pocahontas district. These costs, as already stated, are also net costs, because no intercompany profits were included therein.

BY-PRODUCT COKE.—A comparatively small tonnage of the coke produced by the Steel Corporation is made in by-product ovens, these coke plants being located at certain steel works.

The following table shows the production of by-product coke at two important works in 1910, which comprises all directly produced by the Steel Corporation in that year:

TABLE 28.—STEEL CORPORATION'S BOOK COST OF BY-PRODUCT COKE PER NET TON AT TWO WORKS, AS SHOWN BY PRODUCING SUBCOMPANIES' COST SHEETS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND NET INTEGRATION COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

[1,474,447 tons.]

Items.	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).
Coal, including freight	$3.68	$0.34	$3.34
Producing labor	.25	....	.25
Other operating, less "breeze"	.29	(1)	.29
Rebuilding fund	.05	....	.05
Cost at ovens	4.27	.34	3.93
Net credit for by-products	.58	....	.58
Net cost	3.69	.34	3.35

(1) $0.001 only.

The book cost of by-product coke in 1910 at these two important works, after deducting the credits for "breeze" (fine coke not suitable for furnaces) and for the sale of by-products, was $3.69 per net ton. This cost depends chiefly on the cost of coal, which includes, of course, a considerable freight expense for bringing it to the coke plant. This item of cost for coal was $3.68 per net ton of coke produced as against a total book cost of $3.69 for coke produced. The labor and other operating costs include only those at coke ovens, as the labor and other operating costs at the accessory by-product recovery plant are kept separate and deducted from the gross value of the by-products. The rebuilding fund relates to the coke ovens and is substantially a depreciation allowance.

The gross book cost of the coke was $4.27 per net ton. Against this gross cost the net profit from by-products is customarily credited, which amounted to $0.58 per ton of coke. The deduction of these credits leaves a net cost of $3.69 per net ton of coke, as stated above.

In these book costs as shown above there is an item of intercompany profit included in the price of the coal used which accrued to subsidiary coal companies of the Steel Corporation. This intercompany profit averaged $0.34 per net ton of coke produced.

Deducting this item of intercompany profit from the cost of the coal used reduces the coal cost from $3.68 per net ton of coke to $3.34.

As this is the only item of intercompany profit affecting the book cost of coke at these works, the gross cost of coke, at ovens, and the net cost are reduced in exactly the same measure as the cost of the coal used. The final effect of the elimination of this profit is seen, of course, in the net cost of coke, which was reduced from $3.69 to $3.35 per net ton.

These costs represent, therefore, the net or integration costs of this by-product coke, without including any return to the capital invested in the coal mines supplying the coal, in so far as this part of their coal business is concerned.

Section 5. Steel Corporation's integration costs of pig iron in 1910.

The pig iron produced by the Steel Corporation in 1910 was of three principal kinds, namely, (1) Bessemer (produced only at northern furnaces), (2) Northern basic, used for steel making in open-hearth works, and (3) Southern, used partly for foundry purposes and partly for making open-hearth steel.

For these three kinds of pig iron, which include all the grades important for steel manufacture in 1910, the Steel Corporation's production was 52.5 per cent of the total. Its proportion was highest with respect to Bessemer pig iron, namely, 57.1 per cent, and lowest with respect to Southern pig iron, namely, 25 per cent.[1]

BESSEMER PIG IRON.—Bessemer pig iron was the chief kind of pig iron produced in the United States in 1910, and also the chief kind produced by the Steel Corporation. As it is the basis for the cheapest process of steel making (Bessemer), its cost of production is a matter of great interest. Inasmuch as the ore and other metallic materials, however, are charged in the furnace at market prices, which considerably exceed the actual cost delivered at the furnace, it is obvious that there is no means of forming a definite idea from an ordinary company cost sheet of the real cost of making such pig iron. This is a matter of special importance in the case of

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[1] The total production of the Steel Corporation for these three kinds of pig iron is compared with the total production of the same kinds of pig iron in the United States for the year 1910, in the following table:

COMPARISON OF STEEL CORPORATION'S PRODUCTION OF BESSEMER, NORTHERN BASIC, AND SOUTHERN PIG IRON WITH THE TOTAL PRODUCTION OF THE SAME GRADES IN THE UNITED STATES FOR 1910.

Kinds of pig iron.	Total.	Steel Corporation.	Per cent of total.
	Gross tons.	*Gross tons.*	
Bessemer	[a] 10,977.065	6,269,534	57.1
Northern basic	[b] 8,387,231	4,543,177	54.2
Southern	[c] 2,336,716	585,273	25.0
Total	21,701,012	11,397,984	52.5

[a] Bessemer and low phosphorus. [b] Mineral fuel (i. e., other than charcoal). [c] Tennessee and Alabama only.

Bessemer pig iron, because the Bessemer ores which are used are those which command the highest prices (other conditions, such as iron content and physical structure, being similar).

The following summary table shows simply the average furnace cost (see p. 10) for all the Bessemer pig iron (Northern furnaces) produced by the Steel Corporation, as shown by the producing companies' books, the approximate intercompany profits included in the several items of cost, and the net statistical or integration cost for 1910, as shown by the records of the Steel Corporation:

TABLE 29.—STEEL CORPORATION'S FURNACE COST PER GROSS TON OF BESSEMER PIG IRON, AS SHOWN BY PRODUCING SUBCOMPANIES' COST SHEETS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND INTEGRATION FURNACE COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

[6,269,534 tons.]

Items.	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).
Net metallic mixture	$8.63	$3.68	$4.95
Coke	3.79	.49	3.30
Limestone	.42	.01	.41
Labor	.55	....	.55
Other operating	[1] .50	(2)	.50
Furnace cost [3]	13.89	4.18	9.71

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[1] The amount of this item was $0.69 before deducting credit for furnace gas used in other departments, namely, $0.19.

[2] Intercompany profits $0.002 and losses $0.002.

[3] This does not include any allowance for "additional costs," shown on the profit and loss account. (See pp. 10 and 24.)

The furnace cost of Bessemer pig iron, therefore, as shown by the cost sheets of the manufacturing companies of the Steel Corporation, averaged $13.89 for the year 1910. An interesting feature in this furnace cost is a credit item of $0.19 per ton for gas furnished by the blast furnaces to other departments of the plant where the furnaces were located. This, of course, reduced the "other operating" costs from $0.69 to $0.50 per ton, as shown in the table. This book cost of $13.89 includes, as shown in the second column of the table, certain intercompany profits, as already explained above (see p. 91), which went to the subsidiary mining companies and railroad, vessel, and coal and coke producing companies which supplied the raw materials. The amounts of profit corresponding to this intercompany profit per ton constituted, so far as the quantities of material used in making this pig iron were concerned, the entire net remuneration to the investment in such anterior stages of production and transportation.

It will be noted that the greater part of the total intercompany profit ($4.18 per ton) was included in the cost of the ore entering into the net metallic mixture, namely, $3.68 per ton. While the profit included in the cost of ore used would be considerable for any manufacturing company which produced its own ore and entered it on the cost sheets at market prices, in the case of the Steel Corporation it is greatly enhanced by the fact that the antecedent operations and investment of the Steel Corporation are more diversified than those of any other company. On this account, therefore, the deduction of the intercompany profit for the Steel Corporation results in a much lower statistical or integration cost than would be found in any other case. But, on the other hand, this lower cost corresponds to a much greater investment.

This item of $3.68 intercompany profit in the net metallic mixture is substantially the profit on the ore used and corresponds to a profit of $2. 08 per ton of ore in the average price of the ore at the furnace ($4.81). This multiplication of the ore profit is due, of course, to the fact that about 1.8 tons of ore were required to produce a ton of pig iron.

The item of intercompany profit shown against the cost of coke per ton of Bessemer pig iron, namely, $0.49 per ton, is similar in general character, of course, to that for the net metallic mixture already discussed, but relates almost entirely to coke transfer profits. The amount of profit corresponding to this per-ton profit represents, so far as the particular quantity of coke here considered is concerned, the total remuneration to the investment in the anterior processes of mining coal and making coke. Figured on the coke used, this profit item of $0.49 per ton of pig iron corresponds to a profit of $0.44 per net ton of coke.

The only other item of intercompany profit large enough to appear in the table was $0.01 per ton on the limestone used, and requires no especial comment.

Deducting these items of intercompany profit from the respective items of cost gives the integration or statistical furnace costs of production of pig iron.

The item of net metallic mixture is thereby reduced from $8.63 per ton of pig iron to $4.95 per ton. The item of coke is reduced from $3.79 per ton to $3.30 per ton, and the cost of limestone by 1 cent. There are no other changes in the items of furnace cost as shown by the cost sheets combined. The total reduction in the furnace cost is from $13.89, as shown by the producing companies' cost sheets, to an integration cost of $9.71 per ton. This constituted the furnace cost of the Bessemer pig iron produced by the Steel Corporation, without any return to the investment in mining and transporting the ore or mining the coal and making the coke from it.

It should be clearly understood that this average furnace cost of Bessemer pig iron, as shown by the cost sheets of the Steel Corporation, does not include any "additional costs," such as were presented in Chapters III and V of this report. It was pointed out (pp. 10 and 67) that these additional costs, while based on real expenses and real charges to depreciation, were allotted by a somewhat arbitrary rule. The Bureau did not attempt to make a special ascertainment of these items of additional cost in this case. The items shown for the group of large companies in Table 10, namely, $0.82 per ton of Bessemer pig iron, might be used in the present case. If this were added to the furnace cost as shown above, it would give a total book cost of $14.71 per ton, and a total integration cost of $10.53 per ton. If instead of this additional cost an assumed normal charge of $0.50 per ton were added, the total book cost would be $14.39 and the total integration cost $10.21 per ton.

BASIC PIG IRON (NORTHERN).—Although in 1910 the Steel Corportation made much more basic steel than Bessemer steel, its production of Northern basic pig iron was much less than of Bessemer pig iron, because in making basic steel a large part of the metal used consisted of scrap iron and steel. (See p. 28.) While the antecedent transfer profits for the ore used in making basic pig iron are considerably lower than those for making Bessemer, yet, taking into account also the antecedent transportation profits on ore and the transfer profits on coke, the total integration profits included in the company cost sheets are about three-quarters as large as for Bessemer pig iron.

The following summary table shows the average furnace cost for all the basic pig iron (Northern furnaces) produced by the Steel Corporation, as shown by the producing companies' books, the approximate intercompany profits included in the several items of cost, and the net statistical or integration furnace cost for 1910, as shown by the records of the Steel Corporation.

TABLE 30.—STEEL CORPORATION'S FURNACE COST PER GROSS TON OF BASIC PIG IRON (NORTHERN FURNACES), AS SHOWN BY THE PRODUCING SUBCOMPANIES' COST SHEETS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND INTEGRATION FURNACE COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

[4,543,177 tons.]

Items.	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).
Net metallic mixture	$7.88	$2.60	$5.28
Coke	3.81	.50	3.31
Limestone	.49	.01	.48
Labor	.56	....	.56
Other operating	[1] .46	(2)	.46
Furnace cost [3]	13.20	3.11	10.09

[1] The amount of this item was $0.67 before deducting credit for furnace gas used in other departments, namely, $0.21.

[2] Intercompany profits $0.003 and losses $0.001.

[3] This does not include any allowance for "additional costs" shown on profit and loss accounts. (See pp. 10 and 29.)

The furnace cost of basic pig iron, as shown by the cost sheets of the manufacturing companies of the Steel Corporation, averaged $13.20 per ton for the year 1910. The other operating costs included a credit item of $0.21 per ton for gas furnished by the blast furnaces to other departments of the plant where the furnaces were located. This, of course, reduced the other operating costs from $0.67 to $0.46 per ton, as shown in the table.

This cost includes, as shown in the second column of the table, certain items of intercompany profits (similar to those for Bessemer pig iron) which went to the subsidiary mining, coal and coke, railroad, and vessel companies. The amounts of profit corresponding to these profits per ton constituted, so far as the quantities of material used in making this pig iron are concerned, the entire net remuneration to the investment in such anterior stages of production and transportation.

As in the case of Bessemer pig iron, the largest item of intercompany profit shown is against the cost of the net metallic mixture, namely, $2.60 per ton. While for this item there might be a considerable profit for any concern which combined the mining of Lake ore with the manufacture of pig iron and entered the ore on its cost sheets at market prices, in the case of the Steel Corporation it is unusually large, on account of the fact that this concern has much more diversified operations and investments in the anterior stages of production and transportation. On this account the deduction of the intercompany profits of the Steel Corporation results in a much lower integration cost than would be found in the case of any other maker of pig iron whose costs were shown in the same manner. While the Steel Corporation's net costs are therefore very low, it must be constantly kept in mind that it has a much larger investment, against which it must set the greater margin of profit which obtains between its net cost and the price of pig iron.

This item of $2.60 per ton of intercompany profit in net metallic mixture is practically all for ore, as in the case of Bessemer pig iron, and corresponds to a profit of $1.34 per ton of ore in the average furnace price of $3.98.

The item of intercompany profit set against the coke cost for basic pig iron is $0.50 per ton. It relates almost entirely to the transfer profits from coke used, and, of course, so far as it is taken out of the cost of coke used in making pig iron, it deprives the anterior processes of mining and producing the coke and coal of any remuneration on such investment. Figured on the coke used, this profit item of $0.50 per ton of pig iron corresponds to a profit of $0.43 per net ton of coke.

An intercompany profit of $0.01 for the cost of limestone was the only other item which was of sufficient amount to affect the statement of integration cost.

Subtracting these items of intercompany profit from the respective items of cost gives the integration or statistical furnace cost.

The cost of the net metallic mixture is thereby reduced from $7.88 to $5.28 per ton, and the cost of coke from $3.81 to $3.31 per ton of pig iron. A similar reduction of 1 cent appears for the cost of limestone. The total reduction in the furnace cost, as shown on the cost sheets, was from $13.20 to $10.09 per ton, the latter being the integration or statistical cost for this basic pig iron.

The integration cost of basic pig iron produced by the Steel Corporation, inasmuch as it contains no intercompany profit, does not include any return to the anterior processes of production, namely, ore and coal mining, coke making, and ore transportation.

It has already been explained above (see p. 104), in connection with Bessemer pig iron, that the Bureau did not attempt to ascertain the exact additional costs which appear on the profit and loss accounts, which should be added to these costs to give the total cost. Probably the item shown for large companies in Table 11, namely, $0.54 per ton of basic pig iron, would be near enough to the facts for present purposes according to that method of allocating such costs. If this were added to the furnace cost as shown in the foregoing table, it would give a total book cost of $13.74 per ton, and a net total integration cost of $10.63 per ton. If in place of this additional cost an assumed normal charge of $0.50 per ton were added, the total book cost would be $13.70 and the total integration cost $10.59 per ton.

SOUTHERN PIG IRON.—In the Birmingham district the technical conditions of producing pig iron are such that ordinarily one company operates directly all departments of the business from the mining of ore and coal to the production of coke, pig iron, steel, and various steel products. The only exception for the Steel Corporation is a small local railroad, the Birmingham Southern, which showed practically no profit from the transportation of materials in 1910. In consequence of this company organization there was naturally little occasion to transfer raw materials or other products from one department of the business to another at a profit above the direct cost of production. For these reasons the costs of the Steel Corporation for Southern pig iron do not contain any intercompany profits of importance. The following combined cost sheet for the Southern pig iron of the Steel Corporation in 1910 is at the same time, therefore, a company cost sheet and an integration cost sheet.

TABLE 31.—STEEL CORPORATION'S FURNACE COST PER GROSS TON OF SOUTHERN PIG IRON, AS SHOWN BY THE PRODUCING COMPANY'S COST SHEETS, WHICH COST DOES NOT INCLUDE INTERCOMPANY PROFITS, FOR 1910.

[585,273 tons.]

	Cost per ton of product.
Net metallic mixture	$2.88
Coke	3.80
Limestone	.19
Labor	.75
Other operating[1]	.95
Furnace cost[2]	8.57

This is a strikingly low average cost. Compared with the average costs of Southern pig iron shown on page 21 (which, however, included some trifling items of intercompany profit), it gives evidence of marked superiority in furnace practice, the use of labor-saving devices, and utilization of by-products. The items most greatly reduced are coke, labor, and "other operating" costs. The better showing with respect to other operating costs is explained chiefly by the fact that a more efficient system of utilizing gas from the furnace resulted in an average credit to cost of pig iron of $0.15 per ton.

In the preceding table of furnace cost no account is taken, of course, of the "additional costs" (from the profit and loss statements of the producing company). It would scarcely be proper to take those shown on page 21 for all Southern furnaces for 1902 to 1906 as typical, because the Steel Corporation has, and all companies which keep careful accounts have, much heavier charges generally on this account than there shown. While the additional costs for the large companies for Bessemer and basic pig iron from 1902 to 1906 were very nearly the average for the Steel Corporation, that concern was not represented in the Southern iron industry at that time. Owing to the Corporation's policy of making substantial provisions of this sort, the additional costs from 1902 to 1906 for the Southern district would undoubtedly have averaged much higher if it had been then, as it is now, the principal producer in that district. A fair allowance for these additional charges for general expense and general depreciation is $0.50 per ton, which would make the total cost of Southern iron $9.07.

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[1] The amount of this item was $1.10 before deducting credit for furnace gas used in other departments, namely, $0.15.

[2] This does not include any allowance for additional costs shown on the profit and loss accounts. (See p. 10.)

COMPARISON OF NET COSTS OF PIG IRON.—For convenience in comparison, the net or integration furnace costs (i. e., exclusive of intermediate profits on transfer and transportation) of the Steel Corporation for Bessemer, Northern basic, and Southern pig iron, for the year 1910 are shown in the following table:

TABLE 32.—COMPARISON OF STEEL CORPORATION'S INTEGRATION FURNACE COST PER GROSS TON FOR BESSEMER, NORTHERN BASIC, AND SOUTHERN PIG IRON, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

Items of cost.	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).		Book cost (which does not include any intermediate profit).
	Bessemer (6,269,534 tons).	Northern basic (4,543,177 tons).	Southern (585,273 tons).
Net metallic mixture	$4.95	$5.28	$2.88
Coke	3.30	3.31	3.80
Limestone	.41	.48	.19
Labor	.55	.56	.75
Other operating	.50	.46	.95
Furnace cost [1]	9.71	10.09	8.57

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[1] This does not include any allowance for additional costs shown on the profit and loss accounts. (See p. 10.)

The marked advantage of the Southern pig iron costs, even on a net basis, is evident from the foregoing table. The furnace cost of Southern pig iron was only $8.57 per ton, as against $9.71 for Bessemer and $10.09 for Northern basic; the differences were $1.14 and $1.52, respectively. Of course, from the point of view of quality the Southern ore should be compared with Northern basic and not with Bessemer. On the other hand, however, the Northern pig iron has a great advantage in location with respect to the chief markets of consumption. For market points north of the Ohio River the freights on Southern pig iron are much higher on the average than those for Northern furnaces, and more than offset the advantage in cost of production, as shown above.

The lower costs of Southern pig iron resulted entirely from lower combined costs of the three raw materials. The ore or net metallic mixture of the Southern pig iron averaged only $2.88, as against $4.95 for Bessemer and $5.28 for Northern basic, chiefly due to the very small freight charges involved in getting it to the furnaces. The coke cost of the Southern furnaces, on the other hand, was somewhat higher, namely, $3.80 per ton of pig iron, as against $3.30 for the Bessemer and $3.31 for the Northern basic furnaces. This was due partly to higher costs of coke at ovens, partly to the very much larger quantity of coke required per ton of pig iron. These together more than offset the lower average freight charges in getting the coke (or the coal from which the coke was made) to the furnaces. The cost of limestone was considerably lower for the Southern furnaces, averaging only $0.19 per ton of pig iron as against $0.41 for the Bessemer and $0.48 for the Northern basic furnaces. This was partly due to lower costs of quarrying and of freight to furnace, but also, in an important degree, to the use of Southern ores containing large quantities of lime, which reduced the need for additional fluxing material. Thus the average quantity of limestone used by the Northern furnaces in 1910 was 1,028 pounds per ton of pig iron, as against 675 pounds for the Southern furnaces. There has been a marked change in this respect in recent years. (See p. 23.)

Combining the costs of ore, coke, and limestone, the cost of these three raw materials for the Southern furnaces averaged only $6.87 per ton of pig iron, as against $8.66 for the Bessemer and $9.07 for the Northern basic furnaces.

On the other hand, the Southern furnaces were at a considerable disadvantage in the cost above materials. The labor cost for the Southern furnaces was $0.75 per ton, as against $0.55 for the Bessemer and $0.56 for the Northern basic, and the other operating costs were respectively $0.95, $0.50, and $0.46 per ton of pig iron. The total cost above materials of the Southern furnaces was therefore $1.70 per ton of pig iron, as against $1.05 for the Bessemer furnaces and $1.02 for the Northern basic furnaces. Nevertheless, as shown above, the net furnace cost for Southern pig iron was much lower than either of these two Northern grades, on account of its much lower costs of raw materials combined.

The foregoing table also shows that on the basis of integration cost Bessemer pig iron has an advantage of $0.38 per ton over Northern basic. This advantage depends chiefly on a lower furnace cost of the net metallic mixture after intercompany profits have been eliminated, namely, $4.95 for Bessemer, and $5.28 for basic, a difference of $0.33 per ton. This advantage is partly due to lower costs for Bessemer ores, but also to a lower net cost for freight for the ore going to the Bessemer furnaces. There was not much compensating advantage, evidently, in coke freights for the Northern basic furnaces, as the costs of coke were practically the same. However, as these basic furnaces used a little more coke per ton of pig iron (due to the lower average iron content of basic ores) than the Bessemer furnaces, they probably had a small freight advantage in coke.

Section 6. Steel Corporation's integration costs of ingots for 1910.

The two chief kinds of steel produced in the United States in 1910 were Bessemer and open-hearth steel. The proportions of the Steel Corporation's production to the total production in the United States are shown in the following table:

TABLE 33.—COMPARISON OF THE PRODUCTION OF BESSEMER AND OPEN-HEARTH STEEL PRODUCED BY THE STEEL CORPORATION WITH THE TOTAL PRODUCTION IN THE UNITED STATES, FOR 1910.

	United States.	Steel Corporation.	Per cent.
	Gross tons.	*Gross tons.*	
Bessemer ingots and castings	9,412,772	5,796,223	61.6
Open-hearth ingots and castings	16,504,509	8,383,146	50.8
Total	25,917,281	14,179,369	54.7

While the foregoing table shows the production of both ingots and castings, by far the greater part of it consists of ingots.

Bessemer steel is of two kinds, namely, billet steel and rail steel, both of which were produced in large quantities but the tonnage of which is not reported separately for the United States. The quantity of Bessemer rail ingots produced can be determined very closely, however, from the tonnage of Bessemer rails. The quantity of Bessemer rails produced would indicate that about one-quarter of the Bessemer steel produced in the United States was Bessemer rail steel, and similarly about one-quarter of the Bessemer steel produced by the Steel Corporation was rail steel.

Open-hearth steel is of two kinds, namely, acid and basic. Very little of the former is produced in the United States and hardly any by the Steel Corporation.

BESSEMER BILLET INGOTS.—Most of the Bessemer steel produced is billet steel, which, as already noted (p. 61), is substantially the same as Bessemer rail steel, except that a smaller quantity of manganese is required for billet steel, in consequence of which the cost tends to be a little lower. Inasmuch as the production of Bessemer billet ingots by the Steel Corporation, namely, 4,395,606 tons, was considerably larger than that of Bessemer rail ingots, the costs for the former are a better indication of prevailing conditions of cost.

The following summary table shows the average works cost of Bessemer billet ingots for the Steel Corporation in 1910 together with the intercompany profits included in the items of cost and the integration works cost:

TABLE 34.—STEEL CORPORATION'S WORKS COST PER GROSS TON OF BESSEMER BILLET INGOTS, AS SHOWN BY PRODUCING COMPANIES' COST SHEETS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND INTEGRATION WORKS COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

[4,395,606 tons.]

Items of cost.	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).
Pig iron and scrap	$15.16	$3.85	$11.31
Manganese	.29	.03	.26
Fuel	.15	.02	.13
Labor	.49	....	.49
Other operating	.54	.01	.53
Works cost [1]	16.63	3.91	12.72

[1] This does not include any allowance for additional costs shown on the profit and loss accounts. (See p. 10.)

The works cost of Bessemer billet ingots, as shown by the cost sheets of the subsidiary companies of the Steel Corporation, averaged $16.63 per ton.

The above book cost includes items of intercompany profit, which have been already explained (p. 91), going to other subsidiary companies which produced or transported the materials used. These profits per ton, shown in the second column of the table, constituted the total remuneration per ton going to such producing or transportation companies.

Most all of the intercompany profits in these ingots, which aggregated $3.91 per ton, is found in the profit contained in the book cost of pig iron and scrap, namely, $3.85 per ton. This depends almost wholly, of course, on the transfer profits in ore and coke and the transportation profits in ore.

There was a small profit per ton, namely, $0.03, in the item of manganese, which goes back, of course, almost entirely to the same sources (ore and coke).

The profit in the item of fuel, namely, $0.02 per ton, relates chiefly to the transfer profits contained in the cupola coke used.

There were several other very small items of intercompany profit which could be ascertained, which aggregated $0.01 per ton and which are found in the "other operating" costs. These occurred chiefly in connection with molds and stools (used in casting steel), with a small proportion for steam and negligible items for materials.

The deduction of these items of intercompany profit from the respective items of book cost leaves the integration cost in each case. The book cost of pig iron and scrap is thus reduced from $15.16 per ton of ingots to $11.31. The other changes were small and do not require any further notice.

Deducting the total intercompany profit, namely, $3.91 per ton, from the works cost as shown in the cost sheets ($16.63), leaves an integration works cost of $12.72 per ton of ingots, which is, of course, exclusive of any return to the anterior stages of production, transportation, and manufacture.

No provisions for additional costs appearing in the profit and loss statements are comprised in the cost statement, i. e., general expenses and general depreciation not allocated to costs of products. The Bureau did not ascertain or apportion them for 1910, but the item for such costs shown for large companies in Table 13, on page 57, namely, $0.98 per ton, might be used, although it is undoubtedly too large. This item added to the works integration cost shown in the table ($12.72) would give $13.70 as the total integration cost per ton of Bessemer billet ingots. An additional cost for general depreciation and general expense of $0.60 per ton (including cumulative charges for pig iron) is probably more nearly a normal requirement. (See p. 59). If this be added to the works integration cost, the total integration cost would be $13.32 per ton.

Bessemer rail ingots.—Before 1904 practically all steel rails were produced from Bessemer steel, both for the United States as a whole and for the Steel Corporation in particular; but the production in 1910 was about equally divided between Bessemer and open-hearth steel. The cost of production of Bessemer rails, and therefore of Bessemer rail ingots, is a matter of especial interest. In the first place, this process is cheaper; in the second place, most of the rails produced and sold in foreign countries are made by the Bessemer process (either acid or basic).

The following summary table shows the average works cost of Bessemer rail ingots for the Steel Corporation for 1910, as shown by the books of the producing companies, together with the intercompany profits included in the items of cost and the integration cost at works.

TABLE 35.—STEEL CORPORATION'S WORKS COST PER GROSS TON OF BESSEMER RAIL INGOTS, AS SHOWN BY PRODUCING COMPANIES' COST SHEETS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND INTEGRATION WORKS COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

[1,399,127 tons.]

Items of cost.	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).
Pig iron and scrap	$14.90	$4.66	$10.24
Manganese	.77	[1].01	.78
Fuel	.10	.01	.09
Labor	.52	....	.52
Other operating	.56	[2].02	.54
Works cost[3]	16.85	4.68	12.17

[1] Loss.

[2] In molds and stools, materials, and steam.

[3] This does not include any allowance for additional costs shown on the profit and loss accounts. (See p. 10.)

The works cost of Bessemer rail ingots, as shown by the cost sheets of the manufacturing companies of the Steel Corporation, averaged $16.85 per ton in 1910.

This book cost includes, however, as shown in the second column of the table, certain items of intercompany profits, as explained above (p. 91), going to other subsidiary companies which produced or transported the materials used. These profits per ton comprised the total remuneration per ton accruing to such producing or carrying companies for such products or services.

Practically all of this intercompany profit relates to the pig iron and scrap used in making the steel, namely, $4.66 out of a total of $4.68. This large profit item goes back, of course, through the pig iron to the raw materials, and consists chiefly of profits on ore and coke and the transportation of ore.

Taking all the Bessemer rail ingot production of the Steel Corporation, the prices at which manganese and other similar metallic additions were charged to the steel works resulted in an intercompany loss instead of an intercompany profit; this loss, however, amounted to a little less than $0.01 per ton of product.

The item of intercompany profit in fuel was only $0.01 per ton, and comprised profits in the cupola coke.

The other items of intercompany profit were very small, and came in the molds and stools (used in casting the steel), materials (in repairs and maintenance), and steam. These profit items totaled only $0.02 per ton of product.

. Deducting these items of intercompany profit from the respective items of book cost leaves the integration works cost in each case. Thus, the cost of pig iron and scrap is reduced thereby from $14.90 to only $10.24 per ton of ingots. The other changes in the integration cost do not call for any particular comment.

Deducting the total intercompany profit ($4.68 per ton) from the book works cost of the ingots, reduces it from $16.85 to $12.17 per ton. This constituted the works cost of these ingots, exclusive of any return to the anterior stages of production, transportation, and manufacture.

This works cost, it should be kept in mind, does not allow for any general expenses or general charges for depreciation ("additional cost") appearing in the profit and loss statements of the producing companies and not allocated to particular products. The Bureau did not ascertain or apportion these expenses for the year 1910, but the same additional expense in this case as shown in Table 14, on page 61, for a number of large companies might be used, although it is certainly much too large. This was $1.05 per ton of ingots, and would increase the foregoing works cost as shown on the cost sheets from $16.85 to $17.90 per ton, and the integration cost from $12.17 to $13.22 per ton.

If instead of this amount the estimated normal charge for general expense and depreciation is used, namely, $0.60 per ton (including cumulative charges for pig iron), a lower result is arrived at. This gives a total book cost of $17.45 per ton and an integration cost of $12.77 per ton.

BASIC OPEN-HEARTH INGOTS.—The open-hearth process used by the Steel Corporation is the basic process in the North, and the duplex process in the South. The duplex process consists in first putting basic pig iron through an acid Bessemer converter, chiefly to remove the silicon, and then treating the metal in basic open-hearth furnaces to remove the phosphorus.

The two processes are so different that the costs for each should not be combined. Furthermore, the Northern costs show important items of intercompany profit, while the Southern works, being part of a completely unified company (Tennessee Coal, Iron & Railroad Co.),.do not show any such profits in their costs.

TABLE 36.—STEEL CORPORATION'S WORKS COST PER GROSS TON OF BASIC OPEN-HEARTH INGOTS AT NORTHERN WORKS AND AT SOUTHERN WORKS, AS SHOWN BY PRODUCING COMPANIES' COST SHEETS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND INTEGRATION WORKS COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

Items of cost.	Northern (3,707,749 tons).			Southern (509,007 tons).
	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production).	Company or bookcost(which does not include any intermediate profit).
Pig iron and scrap	$14.03	$3.50	$10.53	$9.36
Manganese	.40	.01	.39	.63
Fuel	.59	.02	.57	.62
Labor	.68		.68	.79
Other operating	.75	[1].01	.74	1.49
Rebuilding fund	.31		.31	.45
Works cost [2]	16.76	3.54	13.22	13.34

[1] In materials, refractories, fluxes, tools, lubricants, etc.

[2] This does not include any allowance for additional costs shown on the profit and loss accounts. (See p. 10.)

NORTHERN WORKS.—The works cost of basic open-hearth ingots in 1910, as shown by the cost sheets, was $16.76 per ton.

This cost includes large items of intercompany profit as shown in the second column of the table. These, as has already been explained above, represent the total profit earned by other subsidiary companies on the materials, etc., charged in the cost sheet, and constituted, of course, in so far as these quantities of material are concerned, the return to the capital invested in anterior stages of production and transportation.

By far the greater part of the intercompany profit charged against the cost of these ingots relates to the item of pig iron and scrap, namely, $3.50 out of a total of $3.54 intercompany profit per ton. This profit goes back, of course, in part to the transfer and transportation profits on ore and coke, and also to coal transfer profits.

In the manganese used there was a small intercompany profit, averaging $0.01 per ton of ingots. As only a part of these ingots were rail ingots, the cost for manganese was naturally lower than for the Bessemer rail ingots above.

The intercompany profit for fuel averaged $0.02 per ton of ingots. This was chiefly due to the transfer profits included in the cost of coal used for making gas in the "producer" furnaces.

There were various very small items of intercompany profit in the "other operating" costs, aggregating a little less than $0.01 per ton of ingots. These occurred chiefly with respect to materials in repairs and maintenance, fluxes, refractories, tools, and lubricants.

Subtracting these items of intercompany profit from the respective items of book cost leaves the integration cost at works in each case. Thus the cost of pig iron and scrap is reduced from $14.03 to $10.53 per ton. The other changes in particular items of integration cost do not require detailed comment.

Deducting the total integration profit, namely, $3.54 per ton, from the works cost of these ingots, as shown on the cost sheets, leaves an integration cost of $13.22 per ton. This constituted the works cost of these ingots, exclusive of any return to the anterior stages of production, transportation, and manufacture.

This works cost, as already explained in the case of other products, does not include any of the unallocated charges for general expense and general depreciation ("additional cost") appearing in the profit and loss statements of the producing companies. The Bureau, as already noted (p. 104), did not ascertain them for the year 1910; but the average figure given for additional costs of basic open-hearth ingots in Table 6, on page 27, might be used. This was $0.79 per ton of basic open-hearth ingots. The addition of this cost to the foregoing integrated works cost of $13.22 would give a total integrated cost of $14.01 per ton of basic open-hearth rail ingots. On the basis of an estimated reasonable charge for depreciation and general expense this is probably too low. Assuming $0.85 as a normal charge (including cumulative charges for pig iron), the total cost for these ingots at Northern works would be $14.07 per ton.

SOUTHERN WORKS.—As already noted, the cost of open-hearth rail ingots at the Southern works, owing to the character and organization of the Southern iron industry, does not include any intercompany profits. The costs are, nevertheless, of considerable interest for purposes of comparison, particularly with those of the Northern works, which have just been considered.

It is evident that for such a comparison the proper basis is the integration cost of the Northern works; otherwise large intercompany profits would be included in the costs in one case and not in the other.

The costs of pig iron and scrap per ton of ingots at the Southern works was $9.36. This low cost was directly due, of course, to the very low furnace costs of pig iron for the furnaces of the Steel Corporation in this district (see p. 107), namely, $8.57 per ton of pig iron. The actual transfer price was $8.60, mostly for hot metal from the blast furnaces. A considerable quantity of scrap was used—about 21 per cent of the total gross metallic mixture—for which the average price was a little over that of the pig iron (because the percentage of pure iron is higher than for pig iron).

In the cost of pig iron and scrap, therefore, the Southern works had a slight advantage over the Northern, these costs being, respectively, $9.36 and $10.53 per ton of ingots.

The manganese cost for the Southern works was $0.63 per ton of product, or $0.24 higher than for the Northern works, but this was because only a small part of the steel produced at the Northern works was for making rails.

In the cost of fuel the Southern works showed $0.62 per ton of ingots, as against $0.57 for the Northern works, in spite of much lower transfer prices for fuel. Both works used hot pig metal, and the differences in the proportion of scrap used were not very large.

The labor cost at the Southern works averaged $0.79 per ton of ingots, against $0.68 at the Northern works. The additional labor involved by the duplex process is thus apparently reflected in the costs. For the item of labor for melting and converting, however, there was no difference, while for charging the open-hearth furnaces the Southern works had a slight advantage; in both cases the explanation is, perhaps, found in the fact that the Southern works used a somewhat higher proportion of hot metal.

The "other operating" costs aggregated $1.49 per ton of ingots for the Southern works and only $0.74 for the Northern works. Here, again, the general explanation is undoubtedly found in the more complicated character of the duplex process. This, for example, requires a much greater expenditure for steam than a simple open-hearth plant.

The rebuilding fund, which is an item of depreciation, was $0.45 for the Southern works, or $0.14 higher than for the Northern.

The total works cost of the Southern works was $13.34 per ton of ingots, as against $13.22 for the Northern works. In order to make a fair comparison it would be necessary, however, to add something to the manganese cost for the Northern works to put them on an even basis in this respect, because the Southern works make rails only. This necessary addition may be estimated at the difference between the two, namely, $0.24 per ton, which would increase the cost at Northern works to $13.46, as compared with $13.34 for the Southern works. Thus, while the Southern steel works had a great advantage in the cost of its pig iron and scrap, this advantage was almost entirely offset by larger costs for other items.

Neither of these average costs just compared include any allowance for additional costs. Assuming an arbitrary addition to the works costs of $0.85 for the Northern works and of $0.95 for the Southern works (which would be greater on account of the duplex process), the total costs would be $14.07 for the Northern works and $14.29 for the Southern works.

Section 7. Steel Corporation's integration costs of heavy steel rails in 1910.

In recent years, as stated above, there has been a very great increase in the production of rails from open-hearth steel, and to a considerable extent this has meant a substitution of open-hearth rails for Bessemer rails. The technical reasons for this change are not of importance here. It is important, however, to note the fact. It may also be repeated that the great bulk of heavy rails produced in other countries are made from Bessemer steel—either acid or basic—and that these are the kinds of rails which figure chiefly in international trade.

The total production of the Steel Corporation and of the United States for both Bessemer and open-hearth rails during the year 1910 is shown in the following table:

TABLE 37.—COMPARISON OF PRODUCTION OF BESSEMER AND OPEN-HEARTH STEEL RAILS BY THE STEEL CORPORATION WITH THE TOTAL PRODUCTION IN THE UNITED STATES FOR 1910.

	United States.	Steel Corporation.	Per cent of total.
	Gross tons.	*Gross tons.*	
Bessemer	1,884,442	1,134,381	60.2
Open hearth	1,751,359	1,004,565	57.4
Total	3,635,801	2,138,946	58.8

The foregoing table shows the total production of steel rails in each case, including light rails and girder rails, as well as heavy standard rails. As these different kinds of rails have considerable differences in cost, it is necessary to show the costs for heavy standard rails separately. Consequently the tonnages covered by the following cost statements are considerably less than the total production of the Steel Corporation in 1910.

BESSEMER RAILS.—Of the total production of Bessemer rails by the Steel Corporation in 1910 (1,134,381 tons), 923,651 tons were heavy standard Bessemer rails. All of these are covered by the following cost statement, which combines the costs of two rail plants of the Steel Corporation making Bessemer rails, for the year 1910:

TABLE 38.—STEEL CORPORATION'S MILL COST PER GROSS TON OF HEAVY STANDARD BESSEMER RAILS, AS SHOWN BY PRODUCING COMPANIES' COST SHEETS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND INTEGRATION MILL COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

[923,651 tons.]

Items of cost.	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).
Ingots	$17.86	$4.83	$13.03
Labor	1.14		1.14
Other operating	1.23	[1].03	1.20
Mill cost[2]	20.23	4.86	15.37

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[1] In fuel, steam, materials, and provision for rolls.

[2] This does not include any allowance for additional costs shown on the profit and loss accounts. (See p. 10.)

The mill cost of heavy standard Bessemer rails, as shown by the cost sheets of the producing companies of the Steel Corporation, averaged $20.23 per ton in 1910. This cost, as in the case of products already discussed, includes considerable items of intercompany profit (see p. 91), as shown in the second column of the table, going to other subsidiary companies, which produced or transported the materials used, these profits per ton constituting the total remuneration per ton accruing to such producing or transportation companies for their products or services.

All but an insignificant portion of this profit relates to the cost of the ingots used, namely, $4.83 per ton in a total of $4.86 per ton. While this appears as a very large item, it must be remembered that it goes back through ingots and pig iron to the transfer profits on the chief raw materials—ore and coke—and also to the large transportation profits on ore, which have been already discussed. The ingots themselves were transferred to the rolling mills without profit over mill cost, but the intercompany profit naturally is increased in this case because it required more than 1 ton of ingots to produce a ton of rails. (Cf. p. 122.)

The other items of intercompany profit were very small, and aggregated for all other operating expenses only $0.03 per ton of rails. These profits related to fuel, steam, materials, and provision for rolls.

Deducting these items of intercompany profit from the respective items of mill cost leaves the integration cost at works in each case.

The book cost of ingots used is thereby reduced from $17.86 to $13.03 per ton of rails, while the other operating items are reduced from $1.23 to $1.20 per ton of rails. The mill cost of rails, in the same manner, is reduced from $20.23 to $15.37 per ton of rails. This net integration cost excludes any return to anterior stages of production, transportation, and manufacture with respect to the materials used in making these rails.

This integration mill cost, furthermore, does not take any account of the "additional costs" of manufacture which appear in the profit and loss accounts of the producing companies not allocated to particular products. These additional costs were not ascertained by the Bureau for the year 1910, as already stated (p. 104), but the average figure given for additional cost of rails in Table 16, namely, $1.29 per ton, or, say, $1.30, is probably a fair approximation to this cost (including cumulative charges for anterior processes), which, in any case, can not be exactly stated. The addition of this cost to the foregoing integrated mill cost of rails, namely, $15.37 per ton, gives a total integrated cost of $16.67 per ton for these Bessemer rails.

Open-hearth rails.—The total output of open-hearth rails by the Steel Corporation in 1910 was 1,004,565 tons. These were produced at both Northern and Southern mills. Heavy standard rails formed about 85 per cent of the total. The costs for these, as shown on the cost sheets of the producing companies, are given in the following table:

TABLE 39.—STEEL CORPORATION'S MILL COST PER GROSS TON OF HEAVY OPEN-HEARTH RAILS AT NORTHERN AND SOUTHERN PLANTS, AS SHOWN BY PRODUCING COMPANIES' BOOKS, APPROXIMATE INTERCOMPANY PROFITS INCLUDED THEREIN, AND INTEGRATION MILL COST, AS SHOWN BY THE RECORDS OF THE CORPORATION, FOR 1910.

Items of cost.	Northern (530,955 tons).			Southern (323,061 tons).
	Company or book cost.	Intercompany profit (approximate).	Integration cost (exclusive of any return to investment on any anterior stage of production or transportation).	Company or book cost (which does not include any intermediate profit).
Ingots	$18.37	$3.54	$14.83	$14.86
Labor	1.19	....	1.19	1.72
Other operating	1.35	.02	1.33	2.66
Mill cost[1]	20.91	3.56	17.35	19.24

[1] This does not include any allowance for additional costs shown on the profit and loss accounts. (See p. 10.)

As the Northern and Southern mills which made these rails operate under different technical conditions, particularly with respect to cost of materials, the costs of each are shown separately. Those for the Southern mill do not show any integration profits for the reasons already stated (p. 107).

NORTHERN MILLS.—The mill cost of heavy standard open-hearth rails at the Northern mills in 1910, as shown by the cost sheets, averaged $20.91 per ton.

This cost includes large items of intercompany profit (see p. 91) which are shown in the second column of the table, which, so far as the material here in question is concerned, constituted the total return to investment of antecedent producing or transportation companies for their products or services.

Of the total integration profit just mentioned, namely, $3.56 per ton of rails, all but a very small fraction was due to the profit in ingots used, namely, $3.54. This profit goes back, of course, chiefly to the large transfer and transportation profits in ore and the transfer profits in coke used. The ingots themselves were transferred to the rail mill without charging a profit over the costs as shown by the cost sheets, though in one case there was a very small item of freight.

The intercompany profits tend to increase for each stage of production, however, on account of the fact that more than a ton of material is required per ton of product. (Cf. p. 122.) The other items of intercompany profit were insignificant, aggregating only $0.02 per ton of rails. They related to fuel, materials, tools, lubricants, and supplies. These items of profit deducted from the respective items of mill cost give the respective integration mill costs.

The book cost of the ingots used is thereby reduced from $18.37 per ton of rails to $14.83; the "other operating" costs from $1.35 to $1.33. Thus the total mill cost of rails is reduced from $20.91 to $17.35 per ton. This integration cost excludes any profit for the anterior processes of production, manufacture, or transportation so far as the quantities of material used in making these rails are concerned.

This net or integration mill cost, moreover, does not allow for any "additional costs" on account of general expense or general depreciation appearing in the profit and loss accounts of this company and not allocated to particular products. These, as stated elsewhere, were not determined by the Bureau for the year 1910, but a fair approximate figure for open-hearth rails (including cumulative charges for anterior processes) probably would be $1.55 per ton. This added to the integration mill cost stated above would give a total integration cost of $18.90 per ton of these open-hearth rails.

SOUTHERN MILL.—As already stated, the cost of rails at the Southern mill, as shown by the cost sheets, does not contain any items of intercompany profit. (See p. 107.) The Southern mill starts, therefore, with practically an integration cost for ingots used, namely, $14.86 per ton of rails, which may be compared with the integration cost for the Northern mills of $14.83 per ton. The elimination of the intercompany profits in this item for the Northern mills puts them, therefore, on a fairly even basis to start with. The labor and other operating costs of the Northern mills are, however, considerably lower, namely, $1.19 per ton for labor and $1.33 per ton for other operating costs, as against $1.72 for labor at the Southern mill and $2.66 for other operating items. Hence, the total integration mill cost of rails is considerably lower for the Northern mills than for the Southern mill, namely, $17.35 and $19.24 per ton of rails, respectively. The addition of an assumed normal charge for general expense and general depreciation (which must be taken at a higher figure for the Southern than for the Northern plants on account of the duplex process), namely, $1.65, would give a total cost for open-hearth rails for the Southern mill of $20.89 per ton. As a matter of fact the overhead charges for the Southern mill are understood to be higher on account of the low production of this mill as compared with capacity. Taking both these groups on the basis of integration cost plus additional charges, therefore, the Northern mills enjoy an advantage of no less than $1.99 per ton of rails. The question of location with respect to markets is not of so much significance in this case as for pig iron, for example. The South and Southwest is, of course, a good market for rails, while for the export trade the Birmingham district has a superior location compared with the Chicago district, though not any better perhaps than Pittsburgh. There does not appear to be much export demand, however, for open-hearth rails.[1]

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[1] A feature in the elimination of transfer profits, and one to which attention is especially called (because the Bureau's method differs from that of the Steel Corporation; see pp. 70 and 120), is the treatment of scrap. The transfer or integration profit in the ore, coke, scrap, etc., may be regarded from two points of view.

The first, and the one adopted by the Bureau, was that the profit, so to speak, proceeded directly forward with the material as it was used in each successive stage of the business until it reached a finished product. Inasmuch as the profits so carried forward did not diminish in amount, but were, broadly speaking, rated against smaller and smaller tonnages of product on account of the successive reductions due to the gross waste, the rate of profit per ton of product necessarily increased in a corresponding degree. None of the profit, therefore, was cut off as belonging to the waste material recovered—e. g., scrap iron and steel. There is therefore a regular and sometimes marked increase in the integration profit per ton, according to the percentage of waste. As the scrap, which is of course used again, does not carry with it any portion of this integration profit (according to the Bureau's computations), it does not contribute to the integration profit in the material used, where such scrap is added to the primary material, as, for example, to the ore in the blast furnace, or to the pig iron in the Bessemer plant or open-hearth furnace. For a highly integrated steel concern, therefore, the Bureau's method tends to give possibly a slightly lower amount of integration profit for the pig iron and a distinctly lower integration profit for ingots than would otherwise be the case. Consequently, a larger increase in integration profit per ton is found between certain products (e. g., ingots and rails) than if the second method were used.

The second method, which is the one used by the Steel Corporation, is to attribute to the scrap recovered a part of the accumulated integration profits contained in the material used for each particular process. This cuts down, of course, the portion of this integration profit going into the product in question by a corresponding amount and consequently the average per ton of product. But the scrap, of course, is used again in prior processes of production (and sometimes in the same process in the case of steel works); that is, the scrap goes back either to the blast furnace or to the steel works. Inasmuch as it carries with it that portion of the integration profit attributed to it, it tends to increase the integration profit in the pig iron or ingots, respectively, and, hence, to give them still higher integration profits, and consequently lower integration costs. In particular, it may be noted, it tends to diminish the difference in the integration profit between ingots and the heavy products rolled therefrom.

This whole subject is a highly technical one, and chiefly of interest, perhaps, to the accountant. Illustrations of the differences in the effects produced by these two methods can be seen, however, by comparing the relative differences in the integration profits in Bessemer ingots and Bessemer rails, as shown by the Bureau's computations (cf. pp. 61 and 66), with the relative differences for the same products as shown by the Steel Corporation's figures. (Cf. pp. 113 and 118.)

It is unnecessary to discuss the relative merits of these two systems. It is obvious that one which is applicable to a highly integrated concern like the Steel Corporation would have no application at all to one which made pig iron only. Such companies, however, were comprised in the Bureau's cost averages. Hence, the best method for the Bureau was to use that which it actually applied.

CHAPTER VIII.

APPROXIMATE INVESTMENT IN RAW MATERIALS, PLANTS, AND WORKING CAPITAL REQUIRED TO PRODUCE A TON OF BESSEMER STEEL RAILS FROM LAKE ORES.

Section 1. Basis of Bureau's computation.

The Bureau is not prepared in this preliminary report to enter into an extended study of costs in relation to investment, but some approximate and tentative figures for one important steel product may be presented in order to afford the reader a general idea of the investment required and of the significance of the cost data already discussed. For this purpose the Bureau selected standard Bessemer steel rails, and based its computations on a plant assumed to use Lake Superior ores and chiefly Connellsville coke. The results are presented in the form of ranges instead of averages. Owing to the important influence of differences in amounts of production upon average figures of investment per ton, averages should be used only with great discretion. Take, for example, a concern with an investment in a rail mill (exclusive of any steel works or antecedent stages) of, say, $4,000,000, with an output of 500,000 tons of rails per year; such a concern would show an average investment of $8 a ton, whereas if it produced only 350,000 tons its average would be $11.50 per ton.

In preparing this discussion the Bureau had very extensive figures of investment for blast furnaces, Bessemer works, and rail mills, and it is believed that the ranges later presented are fair and substantially reliable for the purposes of the approximate conclusions reached. In the case of the raw materials the data available were of a different character, but the Bureau is of the opinion that the results obtained may be relied upon.

While it is desired to arrive at an investment per ton in order to make a comparison with the profits per ton of steel rails, it will be found more convenient to work with amounts of total investment. For this purpose the Bureau has assumed an iron and steel plant producing steel rails, although such a rail mill would of course ordinarily form part of a more comprehensive plant, producing other products for which, however, it is not necessary to present investment data here.

The Bureau assumed an ore consumption of 1,000,000 tons of Bessemer ore yearly. Owing to the fact, as shown on page 21, that about 1.84 tons of Bessemer ore are required to produce a ton of Bessemer pig iron, 1,000,000 tons of ore would produce 544,500 tons of pig iron. Some rail and other scrap, however, could be used with such pig iron in the manufacture of rails. It would require about 105 to 106 tons of such mixture of pig iron and scrap to make 100 tons of ingots, and about 131 tons of ingots to make 100 tons of rails. In the manufacture of rails, however, there would be a large amount of scrap, a part of which could, as just explained, be used in the manufacture of ingots (the remainder being sold or used elsewhere in the works). On this basis, 544,500 tons of pig iron together with the amount of scrap which could be reworked, would produce, roughly, 555,000 tons of rail ingots, and from 425,000 to 430,000 tons of Bessemer steel rails. These computations are necessarily approximate, depending somewhat upon mill practice. The Bureau has based its later calculations on the lower figure, 425,000 tons.

As stated, such a plant as that in question would require an annual ore supply of, roughly, 1,000,000 tons. Without attempting to fix upon what is a proper reserve supply, a period of 30 years may be taken as a fair basis for this discussion. Figuring on this basis such a concern would require an ore reserve of approximately 30,000,000 tons. The length assumed for the reserve period would of course have a direct bearing on the final result.

In the case of coke there would be required to produce the pig iron (544,500 tons) necessary for this production of rails yearly an annual supply of approximately 629,500 tons. As the yield of good coking coal is about 67 per cent in coke, such a coke supply would call for an annual supply of coal of 939,000 tons; on this basis a 30 years' supply would be 28,170,000 tons.

In the case of limestone rather less than half a ton is required to produce a ton of pig iron. The annual supply of limestone needed would be about 250,000 tons, and a 30 years' supply, roughly, 7,500,000 tons.

In this computation the Bureau has not included anything for transportation investment in railroad, steamship, or dock facilities, because the ownership of such facilities and especially railroads by a steel concern is an exceptional rather than a normal condition; accordingly, the investment finally arrived at will be compared with the average profits for 1902 to 1906, as shown by the margin between price and cost exclusive of transfer profits only.

Having arrived at the total quantities of the various raw and intermediate materials required for the production of 425,000 tons of rails per year, the fixed investment in these various stages will now be considered. An allowance for working capital will be made at one point instead of distributing it to the various antecedent stages.

Section 2. Approximate investment required in raw materials.

LAKE ORE.—As above shown, the rail plant here under consideration has been allowed a reserve of, roughly, 30,000,000 tons of Lake Superior ore. From what is said in Chapter IX, it is reasonably certain that an estimate of $0.10 to $0.15 per ton for ore, taking a reserve comprising both leasehold and fee properties, would be sufficiently large. This is on the basis of estimated values for the period 1902 to 1906 and not on what ore might cost a new concern about to enter the steel business at present. Such an estimate would include improvements, as well as the ore and the leaseholds themselves; but, as just pointed out, it would not include anything for working capital. On this basis, the total ore body under consideration, including improvements, would represent an investment of from $3,000,000 to $4,500,000.

It should be noted that, inasmuch as this discussion relates to a plant making Bessemer steel rails, it would be necessary to have a supply of Bessemer ore, and that in order to acquire a reserve of 30,000,000 tons of Bessemer ore in the Lake region it would probably be necessary to make purchases of mining lands which would contain a large amount of other ore. However, while only the total investment required for a Bessemer rail plant is here under discussion, this should be regarded as a part of a larger integrated enterprise. Consequently, non-Bessemer ores which might be incidentally acquired by such a concern in order to get a Bessemer ore supply for its rail plant would be available for the production of other iron and steel products. Hence, it would not be proper to charge the cost of acquiring these non-Bessemer ores against the Bessemer rail plant.

CONNELLSVILLE COKE.—The average fixed investment of the Steel Corporation in coking coal and coke property, as computed by the Bureau for the period 1901 to 1910, was $8.37 per ton of coke produced, this investment covering coke ovens and mining improvements, as well as a very large supply of choice Connellsville coking coal. This investment is undoubtedly too high to be representative of conditions generally. Taking the large steel companies as they are at present organized, it is reasonable to assume that the Connellsville coking coal has not cost, on the average, over $1,000 to $1,200 per acre, and the original cost of the Steel Corporation's coking coal to its principal coke subsidiary (the H. C. Frick Coke Co.) was very much less than this. However, as the H. C. Frick Coke Co. had acquired a large proportion of its present holdings of coking coal land long before the Steel Corporation was organized, the low figures of earlier years can not be fairly used in this computation.

As a rough average, the yield of good Connellsville coking coal per acre may be set at about 10,000 tons.

On this basis an average investment of $1,200 per acre would be equivalent to, roughly, $0.12 per ton. However, there is a large supply of less expensive coking coal, such, for instance, as that from the Pocahontas district, which is entirely satisfactory for blast furnace coke. Assuming that a large steel concern would have some of this coal as well as that in the Connellsville district, the Bureau is of the opinion that an average cost of from $0.10 to $0.12 per ton for a reserve of coking coal would be reasonable. For the 28,170,000 tons of coking coal required in the case of the plant here discussed, this would mean a total investment in coking coal of from $2,817,000 to $3,380,000. To this should be added the investment required in mining improvements, equipment, and miscellaneous facilities, which may be roughly placed at from $1,000,000 to $1,500,000. The investment in an ordinary coke oven may be placed at from $750 to $1,000 per oven, or, say, from about $1.50 to $2 per ton of coke produced. On this basis it would require an oven investment of, roughly, $1,000,000 to $1,500,000 to produce the annual output of 629,500 tons of coke here assumed to be necessary.

STEAM COAL OR GAS.—Some large steel companies purchase their supply, or the bulk of their supply, of steam and heating coal, or have natural-gas properties to furnish the necessary fuel. Others mine their own coal, and therefore an allowance for such a supply may be included in this computation. For a plant producing 425,000 tons of steel rails yearly, and not having natural-gas property, the annual requirements of such coal would probably be in the neighborhood of 150,000 tons. A 30 years' supply on this basis would be 4,500,000 tons. The cost of such supply, including necessary improvements and equipment, may be roughly approximated at $500,000 to $1,000,000, according to the location, quality, and other conditions. A considerable part of this would be for improvements.

In the case of concerns having a supply of natural gas, the investment would probably be somewhat less. For the purpose of this discussion, however, the foregoing estimates of from $500,000 to $1,000,000 may be regarded as covering this fuel supply for power and heating purposes, regardless of whether coal or gas was employed.

LIMESTONE.—The investment in limestone property is comparatively small per ton of output. The cost of a limestone quarry which would yield the above noted annual requirement (250,000 tons) for a 30-year period may be safely estimated at from not more than $75,000 to $150,000.

Section 3. Approximate investment required in manufacturing plants.

Blast furnaces.—For the determination of an average investment in blast furnaces per ton of production, the Bureau had very complete data. As stated in Part I, it obtained from the Steel Corporation a detailed schedule of all of its manufacturing properties as of January 1, 1908, this distinguishing real estate from plants, and, moreover, listing each particular kind of plant, as, for instance, blast furnaces, Bessemer works, rolling mills for each kind of rolled product, as well as auxiliary plants (such as power plants, shops, and pumping plants) separately. Owing to the fact that the real estate, as well as considerable of the miscellaneous property, such as auxiliary plants, had to be distributed among the different manufacturing departments, it was necessary to make some approximations and allocations of a more or less arbitrary character. It was possible to arrive at very close figures for the construction cost of blast furnaces and accessory plants, taking conditions as they actually existed. The real-estate valuations, however, presented a more serious problem. A considerable number of blast-furnace plants of the Steel Corporation are located on very valuable sites, and in distributing the total site among the various departments of the steel works a very considerable acreage was necessarily allocated to the blast-furnace plant. In several instances the land valuations averaged from $20,000 an acre upward. The original cost of this land was, of course, very much less, and it is a fair question how far, in computing the investment required, the enhanced valuation now claimed should be allowed. Since, however, the Bureau is endeavoring to arrive at a result which will substantially represent actual conditions, it was deemed proper to include these plants with very high values of real estate with those built on much less expensive sites in arriving at a general average.

While it is impracticable in this report to present, or even to describe, in detail the Bureau's computations, it is believed that the results arrived at fairly represent the facts as submitted to the Bureau. It is probable, however, that the resulting averages are somewhat too high because of the very high values for real estate just discussed. Nevertheless, such figures of actual investment are far more conclusive than engineers' estimates, which, however carefully made as to plants, would necessarily be exceedingly arbitrary as to plant sites.

As above stated, the Bureau worked from actual production rather than capacity, and for this purpose it took the average actual output for 1905 and 1906. These were both years of large production, and it seemed fair to use these two years, the production for 1907 for these plants severally not being available, though about the same as in 1906.

It was not desirable to use the low production of 1904 in computing the average investment per ton. On this basis blast-furnace plants of the Steel Corporation representing an average annual production for the two years 1905 and 1906 of nearly 10,000,000 tons of pig iron, or practically the total output of the Corporation in those years, showed an average investment per ton of $10.75. The valuations for individual plants showed, of course, a very wide range—roughly, from $4 to $16 per ton. The average valuation for furnaces of several other companies with a total average production in these years of about 1,000,000 tons was somewhat lower, at $10.05.

Taking all the circumstances into consideration, the Bureau is of the opinion that for a rather close approximation a range of from $8.50 to $11.50 per ton is a reasonable one. On this basis the investment in blast furnaces required to produce 544,500 tons of pig iron (the amount which, as above shown, would be necessary—in addition to scrap—to produce 425,000 tons of Bessemer steel rails annually) would be from $4,628,000 to $6,262,000.

BESSEMER STEEL WORKS.—The investment in Bessemer steel converting plants per ton of product was comparatively small, including its fair proportion of accessory plants and of real estate. Actual average figures computed in substantially the same way as for blast furnaces for 41 different Bessemer steel converters, with an average annual tonnage in 1905 and 1906 of nearly 8,000,000 tons, showed an average investment of $1.85, with an extreme range of from $1.11 to $3.45. As an approximation this average investment may fairly be placed at from $1.50 to $2.50 per ton. As above shown, the Bessemer works should produce, roughly, 555,000 tons of ingots yearly in order to provide for a production of 425,000 tons of steel rails. On this basis the investment required in Bessemer works would be from $832,500 to $1,387,500.

RAIL MILL.—The approximate investment in the steel-rail mill, including blooming mill, besides accessory plants and a due proportion of real estate for all of these, on the basis of the data obtained from the Steel Corporation and some other large companies, compared with the average annual output for 1905 and 1906 (2,250,000 tons, or roughly 65 per cent of the total production of the country), showed an average of $8.12 per ton. To use a range, however, the investment may fairly be placed at from $7.50 to $10 per ton of production.

Section 4. Average allowance for working capital.

The foregoing investment, it should be remembered, is for plant and property only, and does not include working capital. The Bureau has placed the average amount of working capital required by a concern completely integrated with respect to raw materials and all stages of manufacture (but excluding railroad, vessel, and dock facilities) at not over $15 to $22.50 per ton of steel rails. The average investment of the Steel Corporation in current assets per ton of all finished steel products for the entire period 1901 to 1910 was almost exactly $22.50. This does not take account of the Corporation's production of Portland cement or of some minor products, such as spelter and sulphate of iron, the inclusion of which would, of course, have reduced the per ton average somewhat. The Steel Corporation, however, carries very large inventories of ore. Moreover, it carries a very large amount of cash in banks. The average amount of cash at the close of each year from 1901 to 1910 was, roughly, $58,000,000. This cash item reduced to a per ton basis is considerably higher than the average for the ordinary large iron and steel concern.

The average net current assets for the three of the largest competitors of the Steel Corporation (the Lackawanna Steel Co., the Cambria Steel Co., and the Jones & Laughlin Steel Co.), per ton of finished steel products, over a period of several years, included within the period 1901 to 1910 (representative data for the entire period not being available because of reorganizations or changes in scope of operations), ranged from $15 to $19 per ton. One reason for the higher average for the Steel Corporation is that the Bureau did not make any deduction on account of working assets employed in transportation.

These averages are for all finished steel products collectively, whereas the amounts of working capital required in the production of different products vary considerably. The average working capital required by a completely integrated concern in the production of steel rails would be considerably less than for several other finished steel products of a more elaborated character, and rather less, it is believed, than the average for all steel products collectively. In this rough approximation in this preliminary report, however, it is unnecessary to enter into refinements and to attempt a distribution of working capital between different products. Such an allocation would be more or less arbitrary under any circumstances. The Bureau has, therefore, used the general averages obtained for all products for representative companies, namely, $15 to $22.50 per ton, as applicable to the production of steel rails, although it is reasonably certain that the higher figure is considerably more than is actually necessary.

Section 5. Indicated rates of profit on basis of 1902–1906 costs.

On the foregoing basis the total average investment in fixed property required to produce a ton of steel rails, with a plant capable of an annual production of 425,000 tons, including working assets at from $15 to $22.50 per ton, would be approximately $55 to $80 per ton. This will appear from the following summary:

TABLE 40.—APPROXIMATE INVESTMENT IN RAW MATERIALS (ON BASIS OF 30 YEARS' SUPPLY) AND IN PLANTS AND WORKING CAPITAL REQUIRED TO PRODUCE A TON OF BESSEMER STEEL RAILS.

[Calculations based on a plant with an annual production of 425,000 tons of Bessemer standard rails and using Lake ore and chiefly Connellsville coke. No investment in transportation facilities is here included.]

	Annual average requirement.	Thirty years' supply.	Approximate investment per ton.	Approximate investment (total).	Investment per ton of rails produced.
	Gross tons.	*Gross tons.*			
Lake ore, including mine improvements	1,000,000	30,000,000	$0.10–$0.15	$3,000,000–$4,500,000	$7.06–$10.59
Coking coal	[1]939,000	[1]28,170,000	.10– .12	2,817,000– 3,380,000	6.63– 7.95
Mine improvements, equipment, and coke ovens				2,000,000– 3,000,000	4.70– 7.06
Limestone	250,000	7,500,000	.01– .02	75,000– 150,000	.18– .35
Coal or gas for heating and steam, including improvements				500,000– 1,000,000	1.17– 2.35
Blast furnaces and accessory equipment	544,500		8.50–11.50	4,628,000– 6,262,000	10.89–14.73
Bessemer steel works and accessory equipment	555,000		1.50– 2.50	832,500– 1,387,500	1.96– 3.27
Rail mill, blooming mill, and accessory equipment	425,000		7.50–10.00	3,187,500– 4,250,000	7.50–10.00
Working capital [2]				6,375,000– 9,562,500	15.00–22.50
Total				23,415,000–33,492,000	55.09–78.80

[1] Net tons.

[2] This working capital covers the entire business of producing rails from the ore up.

It should be understood, of course, that the above computations are more or less approximate. In particular, it may be pointed out that differences in mill practice might have some influence on the investment in blast furnaces and in Bessemer works. The Bureau is of the opinion, however, that the range in which its final results are stated is sufficiently broad to take account of any probable variations in this respect.

With this information it is possible to have some idea of the significance of the profits on steel rails. Thus the price of standard Bessemer steel rails has been fixed at $28 per ton ever since the Steel Corporation was organized. The average cost of steel rails for 1902 to 1906, as shown on page 66, this making no deduction for transportation profits, was $18.80 per ton. This leaves a profit to be distributed over all stages of investment of $9.20 per ton. On the basis of $55 per ton for this investment such a profit would be equivalent to 16.7 per cent, while on the basis of $80 per ton for the investment it would be equivalent to 11.5 per cent.

It should be repeated that the foregoing computations are necessarily rough and tentative. They serve, however, to illustrate the point repeatedly emphasized throughout this report, that in dealing with integration cost figures—that is, cost figures exclusive of any intercompany or interdepartmental profits—it is necessary to keep constantly in mind the greater investment to which such cost figures correspond. It should also once more be repeated that the question of output so vitally affects the average investment when reduced to a per ton basis that the possibilities of variation are very great. It is believed, however, that the range of from $55 to $80 per ton here arrived at is fairly representative of existing conditions. An allowance of $80 per ton is, however, undoubtedly high.

These calculations, therefore, indicate that a price of $28 per ton for steel rails has been a highly remunerative one. The price policy of large steel companies with respect to steel rails has, moreover, been, on the whole, rather more conservative than their policy with respect to many other finished steel products.

It should also be noted that in the case of an exceptionally well-integrated concern like the Steel Corporation, with extensive railroad facilities as well as a large ore fleet, the return would be still greater. Thus the integration cost for the Steel Corporation for the year 1910, this excluding the profit on transportation facilities as well as transfer profits (but approximating the additional costs in the manner noted on p. 119), was only $16.67 per ton. This leaves a profit from the fixed price of $28 for steel rails of no less than $11.33 per ton. The investment, on the other hand, would be greater than that above given, because of the inclusion of the transportation facilities. Without entering into any computations on this point, it is evident, in view of the excessive profits on transportation, that the profit of the Steel Corporation on standard Bessemer rails on the basis of its 1910 integration costs, and allowing for this additional investment, would be considerably higher than the foregoing range of from 11.5 to 16.7 per cent averaged for the Steel Corporation and some other large companies combined, based on transfer profits only.

CHAPTER IX.

IMPORTANT BEARING OF ORE PROFITS ON COSTS AND PROFITS FOR FINISHED PRODUCTS AND ON COMPETITION.

Section 1. Evidence that profit on ore is excessive.

A comprehensive study of costs in relation to investment, as already stated, is not practicable at this time. Such a study, of course, should also include a comparison of costs with the actual prices realized. In the full text of the report it is intended to take up this matter in such fashion as to indicate for at least some of the leading products the rate of return derived from prices realized, although, owing to the great variety of conditions under which the business of different companies is conducted, any comparison of costs and profits with investment must necessarily be somewhat approximate.

As repeatedly pointed out, the mere statement of costs of production, whether before or after the elimination of intercompany profits, is of very little value in judging the reasonableness of prices or profits by products without first obtaining a more or less definite idea of the investment employed or required in the business. If the conditions and prices throughout the entire industry were competitive, and the transfer prices of ore, coke, and other materials in an integrated concern were never charged into the next succeeding process at more than the open-market price, the margin between the final cost so obtained and the selling price would be of some service. When, however, arbitrary transfer or noncompetitive market prices are used, the margin between such cost and the selling price can not have any presumptive claim to be the real margin of profit. On the other hand, when all intermediate profits are eliminated, the margin between such a net cost and selling price must cover a number of different stages of production, and before judging whether this margin is reasonable or not it is necessary to measure the investment required.

It is desirable, however, at this time to point out one vitally important factor in the situation, namely, the bearing of ore costs and ore profits upon costs and profits for succeeding products. It has already been clearly shown that the cost of raw materials, and particularly the cost of ore, is a factor of cumulatively increasing significance in the successive stages of iron and steel manufacture. This is due to the fact that nearly two tons of ore are required to make a ton of pig iron, and, in turn, that in the conversion of pig iron into steel there is some waste, and so on through the successive processes.

If, therefore, the profit on ore itself be unreasonable, it is obvious that this factor becomes increasingly important in relation to the costs and prices of finished iron and steel products.

It is possible that finished products might be sold under keen competition at prices so low that unreasonable antecedent profits of an integrated concern on ore would be neutralized. But if the price of a finished product as compared with book cost is sufficient to leave a reasonable margin for the investment, that margin may prove to be grossly excessive when the unduly large antecedent profits on ore (or any other material) are taken account of. This consideration assumes added importance because of the fact, to be discussed in a subsequent part of this report, that prices of iron and steel products have not been established by free and natural competitive conditions, but on the contrary have, to a large extent, been artificially controlled by price agreements and understandings of a more or less formal character.

In order to reach definite conclusions on this point it would be necessary to present information as to prices realized from the sale of finished products and extensive data as to investment. These matters can not be taken up at this time. It is, however, important to point out here that excessive profits on ore have a very great significance to steel-making concerns which purchase their ore instead of producing it. Obviously, if the price of ore at lower Lake ports is kept at a figure which includes an undue profit, it tends to handicap competition by forcing those iron and steel concerns which do not produce their own supply to pay excessive prices for this principal raw material, and thus reduces their efficiency as competitors in the steel market.

It is highly important, therefore, to determine, if only in an approximate way, whether the profit on ore has been in excess of a reasonable profit.

In this comparison it will be desirable to refer at first only to the transfer profits on ore, and not to both the transfer and transportation profits combined, since the latter were obtained substantially by only one concern—the Steel Corporation.

As already shown, the average cost (without deducting anything for transportation profit) of Lake ore delivered at lower Lake ports for the period 1902 to 1906 was $2.64 per ton.[1] The average transfer profit on this ore over and above the cost for the same period was $0.66 per ton. This alone is very suggestive of an abnormal profit. However, a fairer comparison is to contrast this profit, not with the cost at lower Lake ports, which included, on the average, $1.41 of rail and Lake freight, but with the mine cost plus certain general charges, which together aggregated $1.23. (See p. 16.) It will be seen that the profit of $0.66 per ton was over 53 per cent of the mine cost. Of course, the true significance of profits can not be determined from their relation to costs, but must be compared with investment. Nevertheless, such a rate of profit per ton in ordinary mining is a rather strong indication that the profits were excessive.

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[1] The average cost for this period as shown by the profit and loss statements, however, was $2.67 per ton. (See p. 18.)

The real test is obtained by comparing this profit per ton with the investment per ton in ore property. On this point precise data can not be presented, but it is possible to present convincing arguments of a general character.

COMPARISON OF TRANSFER PROFIT ON ORE WITH INVESTMENT.—As a first step it is necessary to determine upon the investment required to produce a ton of ore in the Lake region. Taking first the investment of the Steel Corporation, it will be recalled that in Part I the value of the Corporation's ore property in 1901, including the improvements, was computed by the Bureau (on a liberal basis throughout) at $100,000,000, and that accepting this as the equivalent of the investment at that time and adding the subsequent investment in Lake-ore property there was obtained a total investment (not valuation) at the close of 1910 of roughly $134,000,000. The average investment for the ten-year period on this basis was $116,807,884. The Corporation's average production of Lake ore for this ten-year period was 17,648,889 tons. This gives an average ore investment in fixed property per ton of ore produced of $6.62. The investment in current assets in its ore mining was not obtained for the entire period, but from data for the years 1905 and 1910, which are believed to be representative, it appears that this investment was approximately $1 per ton. The total investment of the Steel Corporation in Lake-ore properties, including working capital, per ton of production for the ten-year period may therefore be computed at $7.50 to $7.75 per ton.

On this basis a profit of $0.66 per ton would be equivalent to about 9 per cent.[1] However, such a calculation is immediately ruled out of consideration, for the reason that the average investment of $7.50 per ton thus arrived at is undoubtedly in excess of a necessary or normal investment.

In the first place, the Bureau's valuation of $100,000,000 for the Corporation's ore property in 1901 was shown to have been computed on a very liberal basis throughout, and could easily have been scaled down somewhat. Thus, as shown on page 232 of Part I, the Bureau's computations pointed to a valuation of not over $90,000,000. Indeed, this figure was reached only after very liberal allowances for the value of both fee and leasehold property. While on account of the vast figures of investment there dealt with and because only a rough comparison of investment with capitalization was then attempted, it was deemed proper to allow a round $100,000,000 for the Corporation's ore property, it does not follow that such a valuation should be accepted in the present more particular computations of investment per ton in relation to definite profits.

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[1] It should be noted that this profit of $0.66 was an average for several concerns, and not the profit of the Steel Corporation alone.

A second, and exceedingly important, factor is that the Steel Corporation has undoubtedly adopted a policy of securing control of an unnecessarily large amount of ore property. There can be no doubt that as the iron and steel industry is at the present time conducted the acquisition of extensive reserves of ore by steel concerns is a logical, natural, and possibly desirable development. This means, of course, that these steel companies are carrying a large amount of ore property which is idle, and part of which will be idle for many years. However, as shown in Part I of this report, a disposition was clearly apparent in the operations of the Steel Corporation to acquire unduly large reserves. This was evidenced by its policy from the very beginning, and particularly by its lease of the Great Northern ore properties at an extraordinarily high royalty and under onerous conditions. This view, moreover, is strongly confirmed by the recent announcement of the Corporation of its cancellation of this lease effective January 1, 1915. However, nothing was included in the Bureau's computation in Part I of the investment in ore property for this Great Northern lease except for certain development expenditures. But aside from this Great Northern ore, the Steel Corporation at the close of 1910 had fully 1,200,000,000 tons of other ore in the Lake region. This would be equal to at least a fifty years' supply at the present rate of consumption. While the increasing demand for iron and steel products in this country would point to an increasing rate of consumption, it must be remembered that there is a counteracting tendency of considerable importance, namely, the use of an ever increasing stock of scrap iron and steel (which is much more valuable than ore for the manufacture of iron and steel products).

There can be little doubt that any such enormous reserves are really in excess of what the Steel Corporation actually requires as a protection for its investment in manufacturing plants.

This, it should be noted, is aside from the question whether it is desirable from the standpoint of public policy to permit any one interest to secure any such quantity of ore, even if its manufacturing operations might seem to require it.

However, even if it be contended that this is no more than a reasonable reserve for the Steel Corporation (although the Bureau does not assent to this), it is not reasonable to argue that the Steel Corporation is justified in earning the same rate of profit on its investment in this enormous amount of idle ore property that it would be justified in obtaining on the manufacture of finished materials where its capital was actively employed. Instead, it might fairly be contended that the Steel Corporation should not expect to earn on the nonproductive portion of its ore reserves much more than the actual cost of carrying them, and perhaps no return at all.

A special reason for this is that inasmuch as the Lake Superior deposits are the choicest in the country there is a strong probability, provided present conditions of concentrated control are permitted, that in the future the ore in that region will have an enhanced value, which value will largely accrue to the steel companies that control the bulk of this property. In other words, if a company is allowed to speculate in ore reserves, it ought to rely on such speculative increase in value to yield a return for carrying these properties through the nonproductive period. It is not reasonable or proper that a high return should be earned on these reserves held by large companies while they remain undeveloped. This is the ordinary principle underlying the speculative holding of a natural resource. Thus, an investor who holds a plot of idle land in the city for a speculative rise in prices can not expect to earn much profit on it, or, indeed, any profit on it, during the nonproducing period. If his investment includes both actively utilized real estate and idle lands, similarly he could not reasonably expect to receive on his total investment as high a rate of return as he would ordinarily expect to receive on his utilized properties alone.

Finally, it should be kept in mind that any valuations placed upon the Steel Corporation's ore property in 1901 were influenced to a considerable extent by the marked concentration of control of ore properties and of combinations in price making which had taken place prior to the organization of the Corporation. In other words, the 1901 valuation can not be considered by any means as representative either of investment cost or of a value of the same ore properties under really competitive conditions of ownership and operation.

For these various reasons, therefore, it is certain that an investment of $7.50 per ton of ore produced would be too large to be representative of normal conditions in the industry.

It may be noted in this connection that a comparison of the balance-sheet valuations and ore production about the years 1905 and 1906, for several smaller concerns with an aggregate annual production of roughly 3,650,000 tons, indicated an average investment in fixed property of $2.76, and an average investment in working capital of $0.45, or a total of $3.21 per ton of ore produced. Since, however, these balance-sheet valuations are not themselves conclusive evidence of value, this figure can not be accepted without reserve, although it is probably much nearer a reasonable figure than the indicated valuation of $7.50 per ton for the Steel Corporation alone.

On the basis of, say, $3.25 per ton of output as the total required investment in ore property for a representative steel concern an average profit of $0.66 per ton would amount to over 20 per cent.

Another very rough indication of the average investment in ore property per ton of production, at least so far as leased mines are concerned, may be obtained by comparing the reported bonus payments for a number of leases transferred about 1902 with the production of those mines in 1903. Such an average for 10 mines shows an indicated investment in these leaseholds, per ton of production, of $2.82. While this also is too limited a basis from which to draw final conclusions, together with other evidence it indicates that an average investment in leasehold mining property of $3 per ton of output, this including improvements, might be sufficiently liberal. Adding, say, $0.75 for working capital would give a total investment of $3.75 per ton of production, on which a profit of $0.66 per ton would be equal to 17½ per cent.

In Part I it was shown that the maximum price for fee ore in the ground, as reported to the Minnesota Legislature in 1909, by the delegation from St. Louis County (in which county the great bulk of the iron-ore deposits of Minnesota are located) was 15 cents per ton. It was stated, moreover, that this was the highest price ascertained after inquiry. Various records are available showing transfers of iron ore property in fee from 1899 to 1902 at prices which average only a very few cents per ton, and there is no doubt that an average of 15 cents per ton for a large and representative body of ore, such as an ordinary steel concern would have, would be excessive even for the fee ore. It would undoubtedly be much too high to be representative of leaseholds as they ordinarily run. Assuming, however, that the average investment in a great ore reserve consisting partly of fee mines and partly of leaseholds, and including improvements, would be as much as 10 cents per ton, and reckoning on a supply equivalent to 30 to 35 years' requirements of the steel concern, the indicated investment rated against the annual production would be 30 to 35 times this amount, or $3 to $3.50 per ton. This is probably a liberal computation. The average investment per ton in improvements certainly would not be over $1 per ton, and an average of $0.75 per ton for working capital would be sufficient. On this basis the total investment would be $4.75 to $5.25 per ton of production.

The foregoing rough calculations indicate, therefore, that the average investment required to produce a ton of Lake ore for a concern carrying a 30 or 35 years' reserve is considerably less than $7.50 per ton and probably well under $5 per ton. On the basis of $5 per ton an average profit of $0.66 per ton would be equal to about

13 per cent. On the basis of $4 per ton it would be equal to 16½ per cent.

Owing to the uncertain factors in the problem, instead of assuming a definite rate, such a profit may be regarded as equivalent to from 10 to 15 per cent, with the presumption in favor of the higher rate.

The use of such a range of profit percentages instead of a single figure is, moreover, on the whole, more reasonable when working from a per-ton basis because of the very marked changes in investment per ton which may result from different tonnages of production. For instance, a mine with a total investment of $1,000,000, which produces 500,000 tons of ore a year, would show an average investment of $2 per ton, whereas if it happened to produce only 200,000 tons the investment would amount to $5 per ton. Of course, average figures tend to eliminate extreme results; nevertheless, the variations in production from year to year are sufficiently large to make it somewhat unsafe to base positive conclusions upon a single average figure per ton.

On first consideration it might seem that a profit of 10 to 15 per cent, while liberal, is not unreasonable. It should be repeated, therefore, that such a profit in an ordinary mining business, especially where depreciation charges are provided in costs (and in the case of Lake ore costs the depreciation charges on the whole are undoubtedly high), is a very different matter from a profit of the same rate from manufacturing. The mining business taken collectively is one of notoriously poor returns. A few exceptionally well-located or unusually valuable properties may return an extraordinarily high rate of profit; but a large share of mining enterprises, whether in iron or in other metals, are conducted with a very small profit, and frequently without any profit whatever. A profit of 10 to 15 per cent in the Lake Superior iron-mining business under competitive conditions would be liberal even for selected and well-located producing mines. A profit of any such rate for a very large ore property, including a large proportion of idle ore reserves, is extraordinary. On the investment in mines actually worked the average rate of profit would, of course, be very much greater.

A rate of, say, 10 to 15 per cent in the Lake Superior ore business means, therefore, that while carrying vast supplies of ore in reserve for future use the large ore-producing companies (chiefly steel-making concerns) are, nevertheless, on the average making an exceedingly liberal rate of profit on their entire investment in such reserves during the nonproductive period, while, in addition, they may secure a great increase in profit in the future as a result of a probable increase of ore values if the present highly concentrated control of ore properties is allowed to continue.

Comparison of increase in Lake ore prices with increase in costs of production.—There can be no question, therefore, that the average profit of 66 cents per ton on Lake ore shown by the 1902 to 1906 average figures, presented on p. 43, is far in excess of what an average profit would be under ordinary competitive conditions, with more or less scattered ownership of mining property. In fact, under such conditions it is reasonably certain that the average profit on ore for the Lake region as a whole would be a very small amount per ton.

Convincing evidence that the present profits on Lake Superior ore are noncompetitive as well as excessive is, moreover, afforded by a comparison of quoted prices of ore with average ore costs for different periods. While such a comparison can not be regarded as exact, owing to the fact that the ore for which costs are secured may not have been sold at the average prices, nevertheless in the case of Lake ore the base price has been in the main so uniform for particular seasons that such a comparison is of great value. Some idea of the great increase in ore prices since the era of great consolidations in the iron and steel industry (1898 to 1901) is afforded by the following summary of average quoted prices at lower Lake ports for Mesabi Bessemer ore:

1902–1906	$3.57
1898–1899	2.29
Increase	1.28
Per cent increase	56

It is impossible to present comparative lower Lake costs going back to 1898 for any considerable number of mines in the Mesabi Range. Data secured for two very important mines in the Mesabi Range, however, show an average cost at lower Lake ports (including full transportation charge) for the years 1898 and 1899 of $1.98 per ton, and the same mines show an average cost for the period 1902 to 1906 of $2.30 per ton, an increase of $0.32, or 16 per cent.

Taking the years 1898 to 1900, it was possible to get costs for 9,119,011 tons, comprising 10 mines in all. Owing to the fact that there was a "corner" in Lake freights in the year 1900 which resulted in practically doubling that item of cost (from $0.68 to $1.25 per ton), a comparison of lower Lake costs for these two periods would be misleading. Using a normal Lake freight for that year, the total cost at lower Lake ports for this group of mines would have been about $2.08 for the period 1898 to 1900 and about $2.34 for 1902 to 1906, an increase of, roughly, 12 per cent.

It will be seen, therefore, that for the periods compared the increase in the price of Lake Superior ore (56 per cent) was altogether out of proportion to the increase in the cost of production (12 to 16 per cent). The explanation of this is undoubtedly to be found in large part, first, in the concentration of ownership of Lake iron-ore properties in the hands of a very few concerns, and particularly in the hands of the Steel Corporation; and, second, in agreements for the control of ore prices. A discussion of the prices of ore is reserved for a later part of this report. It may be stated here, however, as a notorious and incontrovertible fact, that the price of Lake Superior ore during the greater part of the period 1902 to 1906, and indeed back to 1895, has been established in large measure by agreement among the principal ore-producing interests. It is worth pointing out that in the only year when there was a conspicuous exception to this rule, namely, 1904, the price of Mesabi Bessemer ore fell from $4 in the preceding season to $2.87½, with corresponding reductions in the price of Old Range ores. In the next year Mesabi Bessemer ore was quoted at $3.50 per ton, in 1906 at $4, and in the boom of 1907 at $4.75 per ton. Since then there has been a decline.

It is true that the year 1904 was a year of depression in the iron and steel industry, and that inasmuch as this depression set in in the latter part of 1903 it probably would have been reflected in the ore industry even if the producers' agreement had not been abandoned in the season of 1904. Nevertheless, the average prices for 1904 were by no means unremunerative. As shown in the table on page 43, the total average profit on all Lake Superior ore brought down from mines to lower Lake ports in the year 1904 was no less than $0.36 per ton. This can by no means be considered as a low return.

In view of all the foregoing evidence, there can be no question that the average profit of $0.66 per ton shown for Lake Superior ore for the period 1902 to 1906 was very largely the result of artificial conditions and is distinctly in excess of a reasonable profit under competitive conditions.

Section 2. Effect of excessive ore profits on competitors buying ore in the open market.

Just how much of the average profit of $0.66 per ton on Lake ore above shown for the period 1902 to 1906 is in excess of a reasonable profit can not, of course, be stated in the absence of any general agreement as to what is a reasonable return for the Lake ore business as commonly conducted, nor in the absence of more definite information as to investment. If, however, it be assumed that of the total profit of $0.66 per ton no more than $0.25 per ton is in excess of a fair profit, this becomes a matter of considerable importance in the manufacture of iron and steel products.

For the period 1902 to 1906 it required on the average about 1.9 gross tons of Lake ores (Bessemer and non-Bessemer) to produce a gross ton of pig iron for the Lake ore-using districts collectively. It follows that if the excess of profit is assumed at $0.25 per ton of ore it would amount to $0.47 per ton in the book cost of iron.

Assuming that as much as one-half the average profit was in excess of a reasonable amount, or, say $0.33, this would amount per ton of pig iron to about $0.61.

It is obvious, therefore, that these excessive profits on Lake ore tend directly to handicap effective competition in the production of pig iron and steel by concerns which do not produce their requirements, or the bulk of their requirements, of ore. This policy of maintaining high prices for ore tends, in other words, to put the whole iron and steel market on an inflated cost and price basis to the probable disadvantage of the consumer and to the certain disadvantage of the small nonintegrated producer. There are a number of such producers, especially of pig iron, and the fact that they are able to exist and pay prices for ore which would return any such rates of profit to the producer is an indication of unreasonable profits on finished iron and steel products by at least some steel concerns which produce their own ore. It is true that such integrated concerns do not sell much pig iron and sell very little crude steel on the open market, and it is conceivable that conditions of competition in the sale of finished steel products might be such that these excessive antecedent profits on ore would largely be lost as the result of low sale prices of finished products. That this has been the case in general, however, is clearly discredited by the profits of the Steel Corporation given in Part I, where it is shown that the average rate of profit on the Corporation's total investment (this comparison including profits and investment in transportation) was 12 per cent for the period 1901 to 1910. Any such rate of profit for a concern handling over 50 per cent of the steel business of the country must be considered a very liberal one. Of course, for particular products where unusual conditions of competition were met the results might depart rather widely from this average.

Section 3. Effect of excessive ore profits on costs and profits of finished steel products.

Quite distinct from the effect of excessive ore prices in handicapping competition in the production of iron and steel is the effect of such prices upon costs and profits of finished iron and steel products for the same companies that produce their ore. From the point of view of the consumer, as well as of the independent iron and steel manufacturer, an excessive profit on ore is an important matter. As already shown, $0.25 per ton on a ton of ore means $0.47 in a ton of pig iron. In the conversion of pig iron into steel ingots there is a cumulative increase, while in the conversion of ingots into steel rails there would be a further increase. Starting, therefore, on the assumption that the excessive amount contained in this average profit of $0.66 per ton for Lake ore was $0.25 per ton of ore, this excessive profit finally becomes, as a result of the cumulative process just described, about $0.55 per ton on a ton of steel rails.

If it be assumed that of the total average profit of $0.66 per ton as much as one-half is in excess of. a fair profit, the cumulative profits would be materially increased.

It should be repeated that the Bureau in these computations is not attempting to say to just what extent the profit in question is unreasonable, but instead to present information which will permit of individual opinion on this point, and to point out the increasing significance of any such excessive profit in the successive stages of iron and steel manufacture. It is proper to state, however, that the Bureau regards the assumption that $0.25 per ton out of the total average profit of $0.66 per ton on ore is excessive, as an entirely conservative estimate of such excess, and, moreover, regards it as entirely possible that if all the facts were definitely known more than one-half the total average profit of $0.66 might be regarded as in excess of a reasonable return.

Section 4. Effect of excessive ore transportation profits of Steel Corporation.

The foregoing discussion on ore relates only to transfer profits. A further and exceedingly important consideration arises in the case of the Steel Corporation as a result of the very heavy transportation profit. It will be recalled that the average transportation profit for the Steel Corporation on its own ore over its principal ore-carrying railroads and in Lake vessels, as computed by the Bureau for the period 1902–1906, amounted to $0.60 per ton averaged on the total ore deliveries of the Steel Corporation at lower Lake ports. There can be no question that this transportation profit was grossly excessive. Convincing evidence of this is, indeed, afforded by the fact that the Steel Corporation's principal ore roads, the Duluth & Iron Range and the Duluth, Missabe & Northern, have recently reduced their rates by 20 cents per ton for the haul from Mesabi mines to upper Lake ports, which was formerly $0.80 per ton, and by $0.30 to $0.40 for the Vermilion mines, which formerly had rates of from $0.90 to $1 per ton; the rates from both ranges are now $0.60 per ton. Since this reduction in the rate does not involve any reduction in operating expenses, it may be regarded as equivalent to an admission by the Steel Corporation itself that the former rates were to this extent unreasonable. In the Bureau's opinion the present reduced rate of 60 cents per ton is still excessive. This is clearly indicated by the phenomenally low ratio of operating expenses to gross earnings for these ore roads. Thus the 1910 ratio of the Duluth, Missabe & Northern was below 30 per cent, against an average for all railroads in the United States of 66 per cent, while that of the Duluth & Iron Range Railroad was only 36.5 per cent.

Moreover, the rates of the Steel Corporation over its principal railroad south of the Lakes, the Bessemer & Lake Erie, are undoubtedly excessive, while the dockage charges at lower Lake ports are also unduly large. There is no reasonable doubt that of the average transportation profit of the Steel Corporation in the transportation cost of its ore at furnaces of $0.60 per ton at least as large a portion may be regarded as excessive as in the case of the average profit of all companies on ore. In the case of the Steel Corporation, therefore, the excessive ore profit contained in pig-iron costs and in successive stages may be regarded as at least double that due to excessive transfer profits on ore for all companies collectively.

While integration of industry to permit of large-scale operations at minimum costs is undoubtedly desirable, these enormous profits of the Steel Corporation on the transportation of ore present a problem of very great importance. It is obvious that so long as these railroads are owned by the Steel Corporation the excessive profits thus earned on transportation could be used, if necessary, to the very great disadvantage of competitors in the sale of steel products. It is true that owing to price agreements and price understandings in the steel industry, which will be discussed in a later part of this report, these profits have been retained by the Steel Corporation instead of being thus used as a competitive weapon. Nevertheless, the possibility of their being so used is always present.

The situation, therefore, is this: Integration of the steel industry with respect to transportation thus far, instead of working to the advantage of the public in the form of lower costs to all shippers and lower prices, has inured to the benefit of a great combination. On the other hand, to let the Steel Corporation retain this advantage of low transportation cost and to let this work itself out in the form of lower prices might be undesirable, because it would tend to give the Steel Corporation an unreasonable and undesirable advantage over competitors in the sale of finished products.

This situation clearly raises the question whether the interests of the public may not require the segregation of these railroad properties from the Steel Corporation. It might be argued that such a segregation would simply mean that the control of these railroads would remain in the hands of the interests who dominate the policy of the Steel Corporation. Such segregation, however, at least would prevent the transfer of the profits from these railroads to the treasury of the Steel Corporation. It would thus stop what is unquestionably an evil, and that is the imposition of high rates upon competitors' shipments, which puts them at a great disadvantage, while, at the same time, forcing them by reason of this very fact to contribute unduly to the profits of the Steel Corporation on transportation. If the connection between these railroads and the Steel Corporation were dissolved, there would be no inducement to the Steel Corporation as such to desire unreasonable rates. On the contrary, there would be an inducement to keep these rates at a reasonable level. Under this arrangement, moreover, the iron and steel making concerns using these railroads would be substantially on an equal basis so far as transportation is concerned.

While in the case of integration of ordinary manufacturing enterprises it may be entirely proper that the most aggressive concern should reap the benefit of its enterprise, it is unquestionably different in the case of a public utility, such, for instance, as a railroad. Competition in the construction of railroads is often impracticable. Moreover, the important ore railroads of the Steel Corporation were obtained not through superior ability, efficiency, or foresight, but simply through superior command of capital as a result of combination.

No decision

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